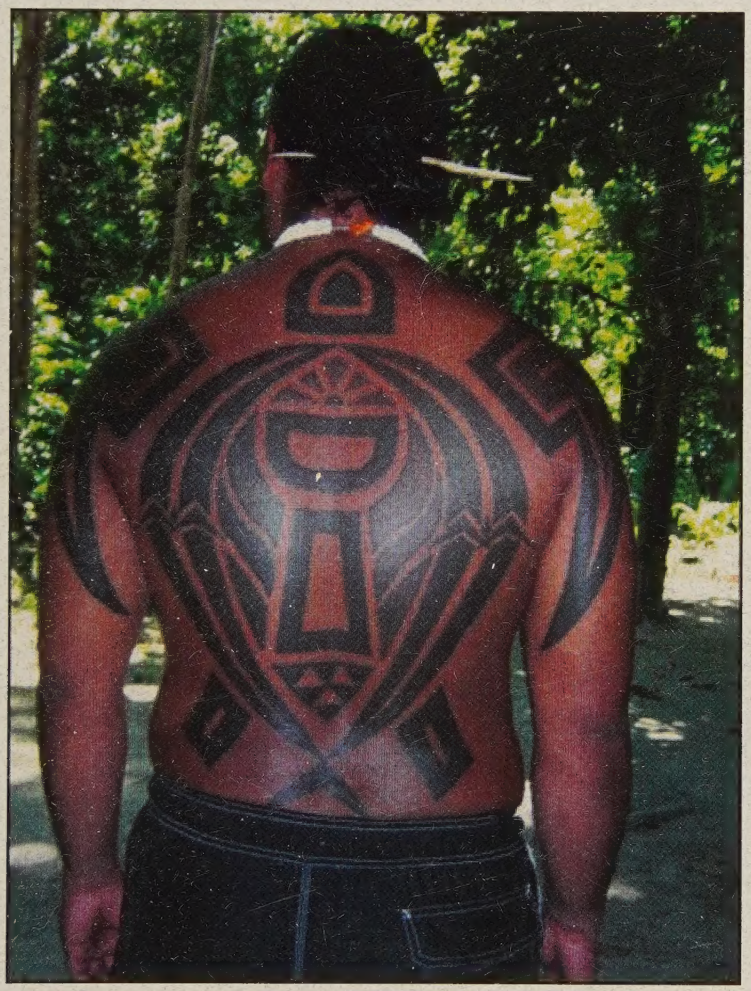
NOAA Technical Memorandum NMFS-PIFSC-36

November 2012

# Commonwealth of the Northern Mariana Islands As a Fishing Community



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Pacific Islands Fisheries Science Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
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# Commonwealth of the Northern Mariana Islands As a Fishing Community

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## INTRODUCTION AND PURPOSE

This report describes the Commonwealth of the Northern Mariana Islands (CNMI) as a fishing community. We have tried to strike a balance between the report being concise enough to be useful while covering the full range of topics and issues necessary to describe CNMI as a fishing community. Readers are encouraged to let us know if we have missed an event, activity or research report that is part of the story of the social, cultural, and economic importance of fishing in CNMI. We will update the report periodically, as social, economic, and environmental conditions change and fishermen and fisheries management adapt to those changes.
We will define below what is meant legally by a fishing community. However, Lee Cataluna's column in the Honolulu Advertiser, June 11, 2002, captures the social, collective nature of community:

> When we talk about "community" we tend to think of structures and infrastructure: rows of houses on well-lit streets, fire stations, gas stations, a Longs down the street if you're lucky. But a strong community isn't just a bunch of people who live next to each other and all keep their lawns mowed; it's a group of people who work together for a common good.

In his book, The Rope of Tradition, Lino Olopai (2005) talked about his experiences as a fisherman and navigator, and about being Carolinian in a changing world. At one point he described how it felt when he moved to Honolulu and became immersed in American culture, and the contrast with the family and community focus of life in the village. His thoughts also reflect the spirit of community:

> At home on Saipan I had been used to always thinking about family and not just about myself...I had been used to working to help the family, so I felt guilty when I wasn't contributing to society in Honolulu (p. 195).

The legal concept of a fishing community comes from the Magnuson Fishery Conservation and Management Act, reauthorized in 1996 and amended by enactment of the Sustainable Fisheries Act (SFA), which also renamed it the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA requires Fishery Management Councils to amend existing fishery management plans and, among other things, pay more attention to human fishing communities. MSA National Standard 8 (NS8) specifies that:

> Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and the rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities (MSA Section 301(a)(8)).

The amendments also defined fishing community:

> The term "fishing community" means a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community. (MSA Section 3(16))

The National Standard Guidelines (50 *CFR* 600.345(b)(3)) provided additional definition of fishing communities:

> A fishing community is a social or economic group whose members reside in a specific location and share a common dependency on commercial, recreational, or subsistence fishing or on directly related fisheries-dependent services and industries (for example, boatyards, ice suppliers, tackle shops).

In response to the mandate of MSA to identify and describe fishing communities, the Western Pacific Regional Fishery Management Council (Council) proposed that each of the major island areas (Hawaii, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands) be identified as a fishing community, because

> In contrast to most U.S. mainland residents, who have little contact with the marine environment, a large proportion of the people living in the western pacific region observe and interact daily with the ocean for food, income and recreation...fishing also continues to contribute to the cultural integrity and social cohesion of island communities...In each island area within the region the residential distribution of individuals who are substantially dependent on or substantially engaged in the harvest or processing of fishery resources approximates the total population distribution. These individuals are not set apart...from island populations as a whole (September 1998, p. 52-53).

On April 19, 1999, the National Marine Fisheries Service (NMFS) approved identification of American Samoa, the Northern Mariana Islands, and Guam as fishing communities (64 *FR* 19067). NMFS rejected the characterization of the State of Hawaii as a fishing community, saying it was overly broad and encouraged the Council to identify fishing communities in Hawaii at smaller scales.[1]

Another definition of fishing communities provides additional insight into the type of information useful in fishing community profiles. The Community Demonstration Project Program was designed by the Council to promote involvement of western Pacific communities in western Pacific fisheries. The program gives grants to 3-5 communities for fisheries demonstration projects to foster and promote traditional indigenous fishing practices. Program goals are to demonstrate application or adaptation of methods and concepts derived from

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[1] In 2004, NMFS approved a Council recommendation to identify each of the inhabited, main islands of the State of Hawaii as a fishing community (Kauai, Niihau, Oahu, Maui, Molokai, Lanai, and the island of Hawaii).

traditional indigenous practices, to enhance opportunities for communities to participate in fisheries, and to benefit indigenous communities that haven't been able to sustain participation in fisheries or marine resource management of their native lands. The program's definition of fishing community reflects its purposes and links well to program priorities:

> A population of non-transient people descended from the aboriginal people indigenous to the area who share a common history based on social, cultural, and economic interactions and a functional relationship sustained by participation in fishing and fishing related activities. Priorities are promoting fishery resource stewardship, and community economic growth and stability, self-determination, and solidarity.

The first part defines the nature of community by emphasizing social, cultural, and economic interactions in a certain place. The second part, which corresponds to NS8's language on substantial dependence or engagement, characterizes a fishing community as being sustained socially, culturally, and economically through fishing and related activities.

The description of CNMI as a fishing community is especially relevant because NMFS and the Council are shifting to an ecosystem-based approach to fisheries management. One aspect of this approach is facilitating community-based management (WPRFMC, 2009a). Management of natural resources is usually discussed in terms of scientific research and government regulation without regard to the level of public confidence and cooperation in the process. However, an ecosystem-based approach recognizes that responsible actions by citizens and communities are necessary for long-term wise use of marine resources. In some cases, localization can rebuild the connections to the natural world lost in the current globalized and transient society.

In August 2004, President Bush issued Executive Order 13352 to promote partnerships between federal agencies and states, local governments, tribes, and individuals that will facilitate cooperative conservation and appropriate inclusion of local participation in federal decision-making regarding the Nation's natural resources. Similarly, the U.S. Ocean Action Plan (2004), the Bush Administration's Response to the U.S. Commission on Ocean Policy, found that "local involvement by those closest to the resource and their communities is critical to ensuring successful, effective, and long-lasting conservation results." Evidence indicates that many community-based approaches in U.S. land management are achieving success (Yaffee, 1999; McCaffrey, 2006; Cheng and Fernandez-Gimenez, 2006), and there has been increasing emphasis on community-based approaches to natural resource management worldwide (Birkes et al., 2000; Cheng and Fernandez-Gimenez, 2006). For example, subsistence fisheries in the Pacific may best be managed through community involvement (King and Lambeth, 2000).

Ecosystem-based management is made up of many interrelated components and integrated activities. Species management cannot be conducted effectively without consideration of other components of the marine ecosystem, upstream watershed, and political, cultural, and economic influences. Just as biodiversity can strengthen the resilience of natural systems, diversity in management approaches, such as connecting community-based initiatives with governmental programs, can provide a valuable contribution that allows for locally relevant management strategies. The Council's fishery ecosystem plans (FEP) are focused on community

collaboration, participation, and partnership (WPRFMC, 2009a). Successful resource management will need to incorporate the perspectives of both local and national stakeholder groups in a transparent process that explicitly addresses issues of values, fairness, and identity.

The Council's FEPs organize management by archipelago, so Guam and CNMI are contained in a single Marianas Archipelago FEP. This report thus should be considered in tandem with the report on Guam as a Fishing Community (Allen and Bartram, 2008). It also serves as a sociological counterpart to biophysical descriptions of Mariana archipelago marine resources (for example Brainard and others 2012).

## Organization of this Report

The next chapter provides an overview of the location and environmental setting of CNMI, followed by a history of settlement, population, and fishing traditions until about 1980. The subsequent chapters describe recent and current socioeconomic conditions in the CNMI and provide a contemporary snapshot of fishing, its socioeconomic and cultural importance, and management institutions. The final chapter identifies some key issues that can be monitored to help assess the ways in which CNMI is changing as a fishing community.

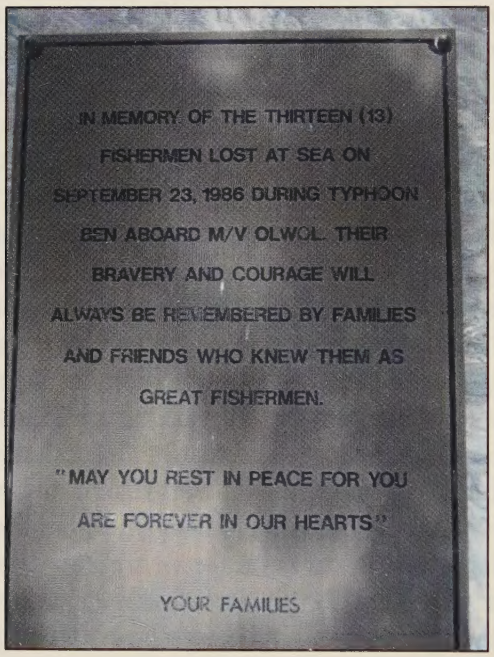
IN MEMORY OF THE THIRTEEN (13)
FISHERMEN LOST AT SEA ON
SEPTEMBER 23, 1986 DURING TYPHOON
BEN ABOARD M/V OLWOL. THEIR
BRAVERY AND COURAGE WILL
ALWAYS BE REMEMBERED BY FAMILIES
AND FRIENDS WHO KNEW THEM AS
GREAT FISHERMEN.
"MAY YOU REST IN PEACE FOR YOU
ARE FOREVER IN OUR HEARTS"
YOUR FAMILIES

Photo 1.--The plaque on The 13 Fishermen Memorial Monument on Beach Road in Garapan, Saipan. Family members and friends of the 13 fishermen lost at sea aboard M/V *Olwol* during Typhoon Ben on September 23, 1986, continue to observe the anniversary of their deaths with a Mass followed by a gathering near the monument (David, 2010). The names of the 13 fishermen are Isidro R. Romolor, Jose T. Igisaiar, Silvestre R. Selepeo, Joaquin L. Moteisou, Juan Benusto R. Olopai, Enrique L. Moteisou, Guillermo Saures, Benusto M. Lisua, Joseph R. Kaipat, Petro L Mettao, Martin L. Saures, Joseph T. Lisua, and Jovencio C. Falguera. The names of two other fishermen, Emilio T. Lisua and Antonio S. Fitial, who died on the same day, are included on the monument. Photo Credit: J. Amesbury.

## LOCATION AND SETTING

The Commonwealth of the Northern Mariana Islands lies between 14° and 21° north latitude at about 145° east longitude (Fig. 1). The geological division of the Mariana Archipelago differs from the political division. Politically there are 2 entities, Guam and the CNMI. The latter is made up of the 14 islands north of Guam, while the former encompasses only the island of Guam. Geologically there are 2 island arcs. The southern arc includes the 6 islands from Guam to Farallon de Medinilla, while the northern arc includes the 9 islands from Anatahan to Uracas.

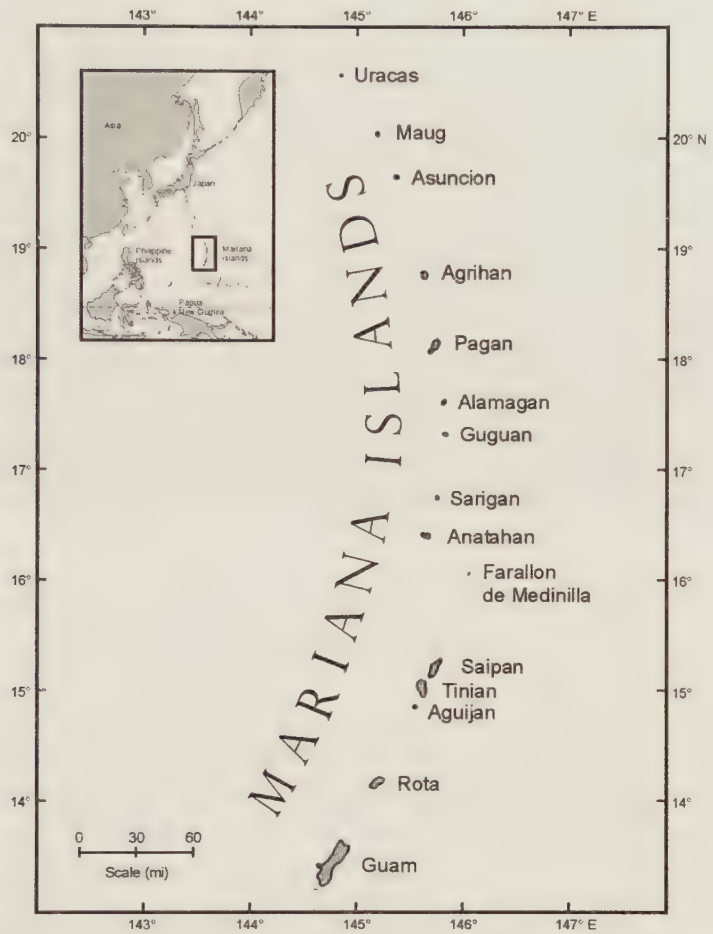


Figure 1.--Mariana Islands. Map courtesy of Barry Smith, University of Guam Marine Laboratory.

The southern arc islands, which began to form about 43 million years ago (Randall, 1995), are older and larger than the islands of the northern arc. They are raised limestone islands with volcanic cores and well-developed reef flats and coral reefs. The southern arc islands are much more densely inhabited by people and, according to one survey, have nearly twice as many species of fishes as the islands of the northern arc (Donaldson et al., 1994) and much higher levels of biomass of larger fish (Starmer et al., 2008).

The northern arc islands are younger, smaller, high volcanic islands with steep slopes and limited coral development. They are still volcanically active. Pagan erupted in 1981 and Anatahan

began to erupt in 2003 (Photo 2). The northern arc islands are sparsely inhabited (6 people in the 2000 census) and have fewer species of fishes than the southern arc islands.

Photo 2.--Anatahan erupting on May 11, 2003. Photo Credit: Allan Sauter.

Land area of the CNMI is approximately 184 square miles or 477 square kilometers. Saipan, Tinian, and Rota in the southern arc are the largest islands in the CNMI, followed by Pagan and Agrihan in the northern arc (Table 1).[2] The Marianas Trench lies to the east of the islands, and several seamounts occur to the west of the islands along the West Mariana Ridge, the 'third arc' in the Archipelago. The U.S. exclusive economic zone (EEZ, 0-200 nautical miles offshore) surrounding the CNMI covers 292,712 square miles or 758,121 square kilometers. The CNMI EEZ abuts Guam's EEZ to the south and Japan's EEZ to the north.

The CNMI's climate is marine tropical with a wet season from July through October and a drier season the rest of the year. The year can be further divided into a first quarter characterized by dry conditions with steady northeasterly trade winds, a second quarter which is dry with relatively quiet winds, a third quarter when winds remain light with higher probability of rainfall and increased chance of typhoon events, and a fourth quarter having trade winds return with heavy rainfall and potential for severe storm activity. The mean annual temperature in the Marianas is 83° F with a mean annual rainfall in Saipan of 84 inches (Starmer et al., 2008). The trade winds blow from the northeast during winter and spring. Typhoons are most likely to occur during summer and fall, pushing swell from the SW. CNMI receives 60% of its annual rainfall in the 4-month period from July to October. Interannual variations of CNMI rainfall are affected by the El Niño-Southern Oscillation (ENSO) ocean-atmosphere phenomenon; CNMI is

[2] Chapter 5 contains information about current population and demographics.

in an ENSO core region characterized by very dry conditions in the year following El Niño and an increase in the threat level from typhoons during an El Niño year (Lander, 2004). Typhoons and El Niño years affecting Saipan's ecosystem from 1945 to 2005 are shown on Figure 2.

Table 1.--Land areas of the Mariana Islands (Karolle, 1993; Farrell, 1991).

| **Southern Arc Islands** | **Area (sq. mi.)** | **Northern Arc Islands** | **Area (sq. mi.)** |
|---|---|---|---|
| Farallon de Medinilla | 0.35 | Uracas (or Farallon de Pajaros) | 0.79 |
| Saipan | 47.46 | Maug | 0.81 |
| Tinian | 39.29 | Asuncion | 2.82 |
| Aguijan (or Aguiguan) | 2.77 | Agrihan | 18.29 |
| Rota | 32.90 | Pagan | 18.65 |
| Guam | 214.00 | Alamagan | 4.35 |
| **Total for the Southern Arc Islands** | **336.77** | Guguan | 1.62 |
| | | Sarigan | 1.93 |
| | | Anatahan | 12.48 |
| | | **Total for the Northern Arc Islands** | **61.74** |

## HISTORICAL OVERVIEW OF SOCIETY AND FISHERIES

### Prehistoric Period

People have lived in the Mariana Islands for at least 3500 years, or about 3000 years prior to European contact (http://www.doi.gov/oia/Islandpages/cnmimain.htm). The Prehistoric Period lasted from the arrival of the first people by at least 1500 BC until the arrival of Magellan in AD 1521. Spoehr (1957) divided the long Prehistoric Period into the Pre-Latte Phase and Latte Phase (Fig. 3). Subsequent authors (Moore and Hunter-Anderson, 1999; Craib, 1990; Moore, 1983) have proposed various subdivisions of the Pre-Latte Phase.

Pre-Latte Phase cultural deposits are found below the surface usually along the coasts. Two of the earliest sites in the Marianas have been excavated on the west coast of Saipan. These are Achugao in northwest Saipan (Butler, 1995) and Chalan Piao in southwest Saipan (Amesbury et al., 1996; Moore et al., 1992; Spoehr, 1957). Unai Chulu in Tinian is another site with Early Pre-Latte Phase deposits (Haun et al., 1999). Artifacts that characterize the Pre-Latte Phase include pottery shards with red-slipped exterior surfaces, some of which are decorated with lime-filled designs, and beads and bracelets made from cone shells.

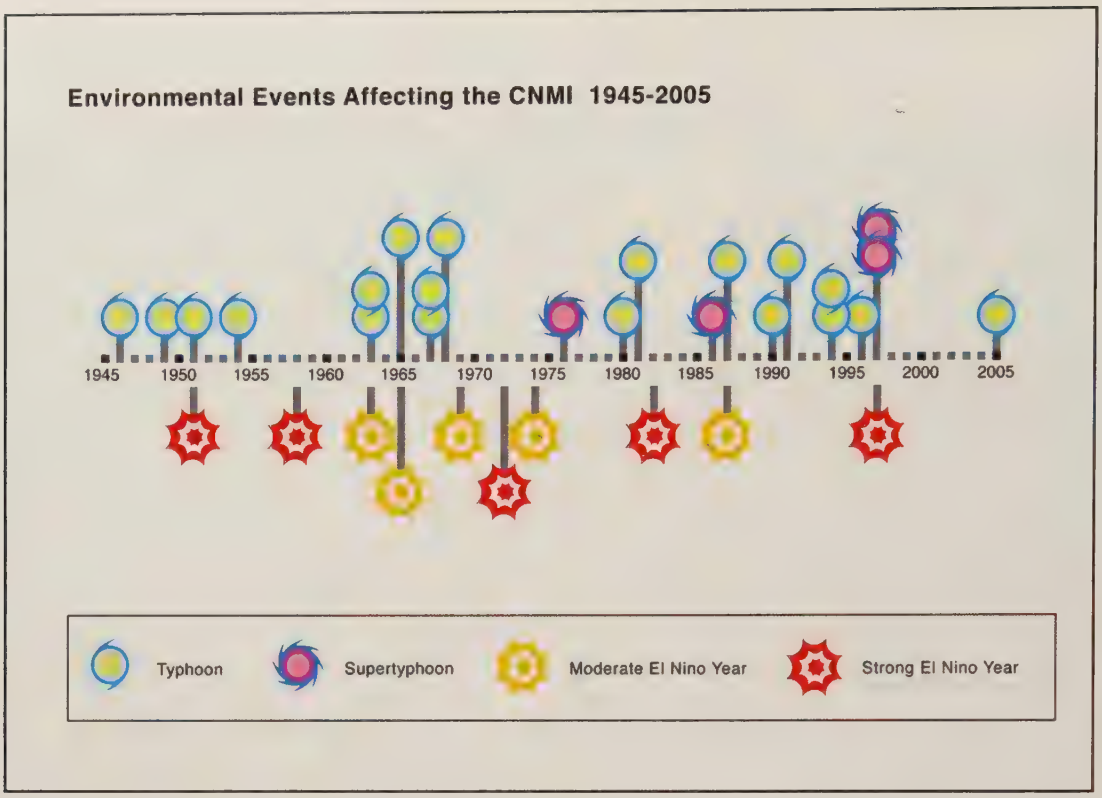


Figure 2.--Typhoons and El Niño Years affecting Saipan from 1945 through 2005. Credit: Robert Amesbury.

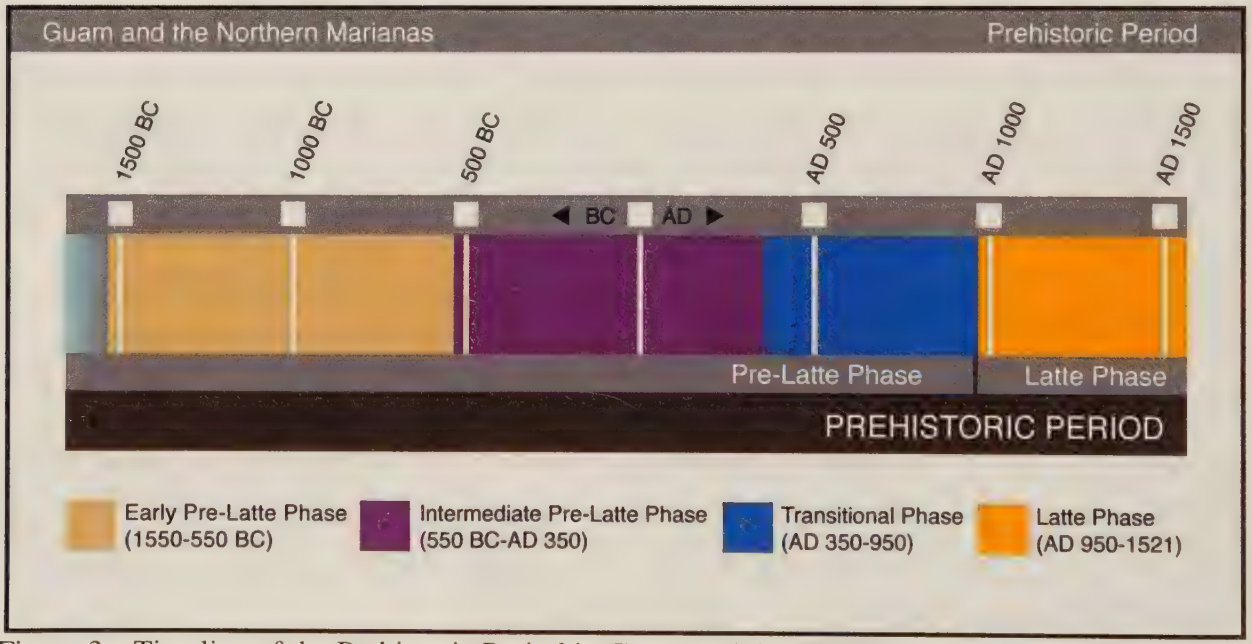


Figure 3.--Timeline of the Prehistoric Period in Guam and the CMNI showing Spoehr's (1957) broad phases of Marianas prehistory as subdivided by Moore and Hunter-Anderson (1999). Credit: Robert Amesbury.

The Latte Phase began by at least AD 1000 and is characterized by the megalithic features called latte sets. A latte set consists of two parallel rows of upright stone shafts (known as *haligi* in Chamorro) associated with capstones (*tasa*) (Photo 3). The number of shafts in a set varies, but sets with 8, 10 or 12 shafts are common (Hunter-Anderson and Moore, 2002; Graves, 1986). Based on the cultural materials and features associated with latte sets, they are believed to have functioned as foundations for residential structures.

Photo 3.--The "wall latte" at Mochong, Rota, with upright shafts and fallen capstones along one side and five limestone blocks along the other side. Photo Credit: J. Amesbury.

Latte Phase sites are widely distributed along the coastline as well as in the interior of the Mariana Islands. They are found not only on the major islands of the southern arc, but on the islands of the northern arc as well. Figure 4 shows the distribution of latte stones observed on Saipan by Hans Hornbostel in the 1920s. The largest latte stones erected are at the House of Taga on Tinian, although larger ones can be seen still in the ground at As Nieves Latte Stone Quarry on Rota. Characteristic artifacts of the Latte Phase include plain pottery sherds, stone mortars, and shell beads made from *Spondylus*.

During the Prehistoric Period the inhabitants of the Mariana Archipelago, who are now known as Chamorro, were in contact with one another. Evidence shows that all the islands shared the same culture and language. Archaeological assemblages from the various islands are similar. It is possible that the Chamorro were also in contact with their closest Micronesian neighbors, the Refaluwasch people of the Caroline Islands to the south. The ocean-going sailing canoes of both groups would have made that possible.

Figure 4.--Hornbostel's (1924-25) map of Saipan with shading showing the distribution of latte stones.

## Prehistoric Period Fishing

When the first people arrived in the Marianas between 3500 and 4000 years ago, there were no large land mammals to hunt, but the ancient Chamorro had an almost unlimited supply of animal protein from the sea. They fished for both reef and pelagic (open ocean) species and collected mollusks and other invertebrates, including crustaceans and echinoderms. They also caught sea turtles.

There is no written record for the Prehistoric Period. Instead, archaeologists study the archaeological record, the artifacts (man-made objects) and ecofacts (natural objects with archaeological significance) left in the ground by the people of that period. Faunal analysts, such as Foss Leach and Janet Davidson of the Museum of New Zealand Te Papa Tongarewa, calculate the Minimum Number of Individuals (MNI) in archaeological fish bone collections by identifying the unique or paired bones from fishes. They also suggest what methods were used for catching the fishes based on the technology of the time period, the habits and habitats of the fishes, and ethnographic comparison.

Table 2 is an example of the results of fishbone analysis. Leach et al. (1990) were able to identify 313 fishes from the archaeological collections from Mochong, Rota. The families of fishes are grouped by probable fishing methods. The Mochong site was occupied during the Pre-Latte and Latte Phases from about 1000 BC to AD 1700 (Craib, 1990). (See Photo 3 in this report.)

Table 2.--Likely catch methods of fishes from Mochong, Rota by families with Minimum Number of Individuals (MNI) and percent MNI (Leach et al., 1990).

| Likely Catch Method | Family or Other Group | Common Name | MNI | Percent MNI |
|---|---|---|---|---|
| Netting | | | 105 | 33.5 |
| | Bothidae | Left-eyed flounders | | |
| | Scaridae | Parrotfishes | | |
| | Acanthuridae | Surgeonfishes | | |
| | Balistidae | Triggerfishes | | |
| | Aluteridae | Filefishes | | |
| Demersal Baited Hook | | | 109 | 34.8 |
| | Epinephelidae | Groupers | | |
| | Lutjanidae | Snappers | | |
| | Nemipteridae | Monocle breams | | |
| | Lethrinidae | Emperors | | |
| | Coridae | Wrasses | | |
| | Coridae/Labridae | Wrasses | | |
| Pelagic Lures | | | 51 | 16.3 |
| | Acanthocybiidae | Wahoo | | |
| | Coryphaenidae | Mahimahi | | |
| | Carangidae | Jacks | | |
| | Thunnidae/Katsuwonidae | Tunas including yellowfin and skipjack | | |
| Harpoons or Bait Trolling | | | 10 | 3.2 |
| | Istiophoridae | Marlins, sailfishes | | |
| | Istiophoridae/Xiphiidae | Marlins, sailfishes/ Swordfishes | | |
| General Foraging | | | 23 | 7.3 |
| | Holocentridae | Squirrelfishes | | |
| | Aphareidae | Snappers | | |
| | Kyphosidae | Sea chubs or rudderfishes | | |
| | Scorpaenidae | Scorpionfishes | | |
| | Diodontidae | Porcupinefishes | | |
| | Tetraodontidae | Puffers | | |
| Basket Traps | | | 8 | 2.6 |
| | Muraenidae | Moray eels | | |
| Opportunistic Catch | | | 3 | 1.0 |
| | Elasmobranchii | Sharks and rays | | |
| No Strong Opinion | | | 4 | 1.3 |
| | Platacidae | Batfishes | | |
| | Teleostomi | Includes bony fishes | | |
| **Total** | | | **313** | **100.0** |

This type of fishbone analysis has been conducted for several archaeological sites in the Northern Marianas (Amesbury and Hunter-Anderson, 2003; 2008). Sites on Rota that have yielded pelagic fish remains from the families Coryphaenidae (mahimahi), Istiophoridae/Xiphiidae (marlin, sailfishes, and swordfishes), and Scombridae (tunas and wahoo), and sea turtle remains from the family Cheloniidae are shown on Figure 5. Other sites in the CNMI that have yielded pelagic fish remains dating to the Prehistoric Period include Afetña, Saipan, and Unai Masalok and Tachogna, Tinian.

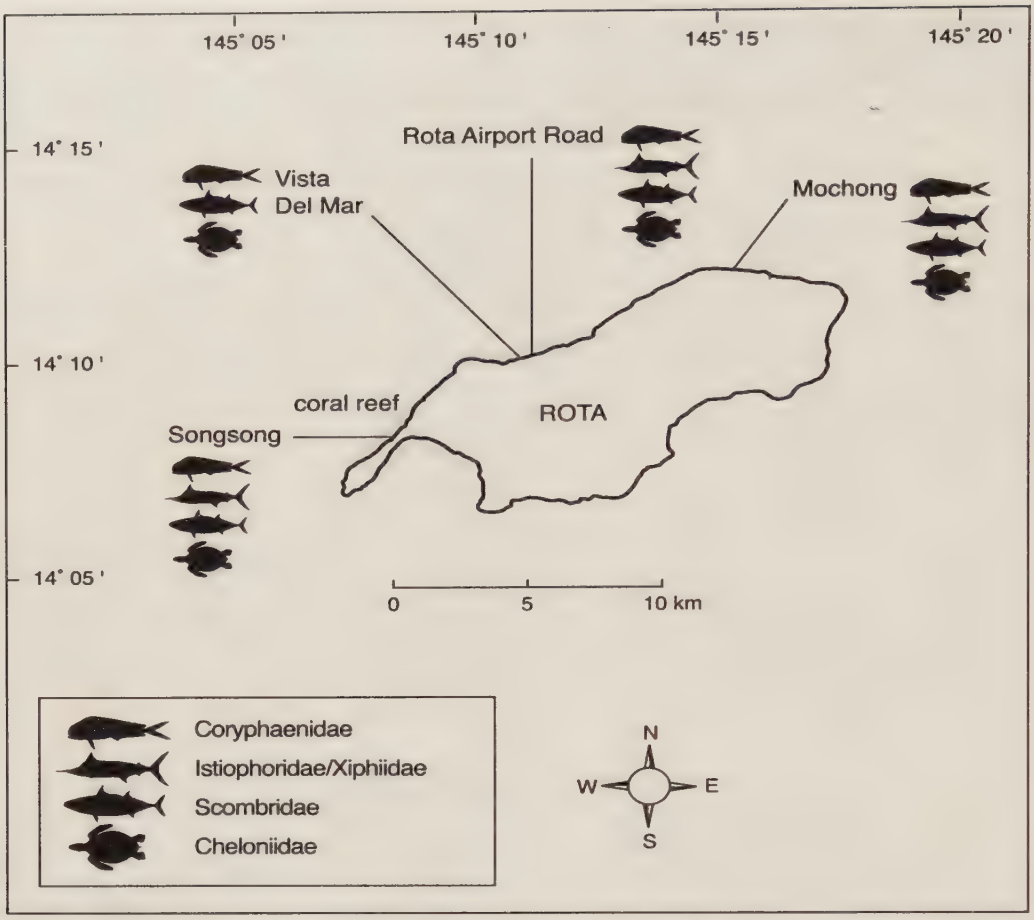


Figure 5.--Rota, showing archaeological sites with pelagic fish and turtle remains. Credit: Robert Amesbury.

In addition to the remains of fishes, invertebrates, and turtles, archaeologists find pieces of fishing gear, including one-piece fishhooks (Fig. 6) and composite fishhooks, gorges, fishing weights, and bone spears or harpoons (Fig. 7). Many one-piece J-shaped hooks and V-shaped gorges were made from *Isognomon* shell. Composite hook points and shanks were made from shell and bone and possibly wood. Human bone spear points may have been used in fighting and/or for harpooning fishes.

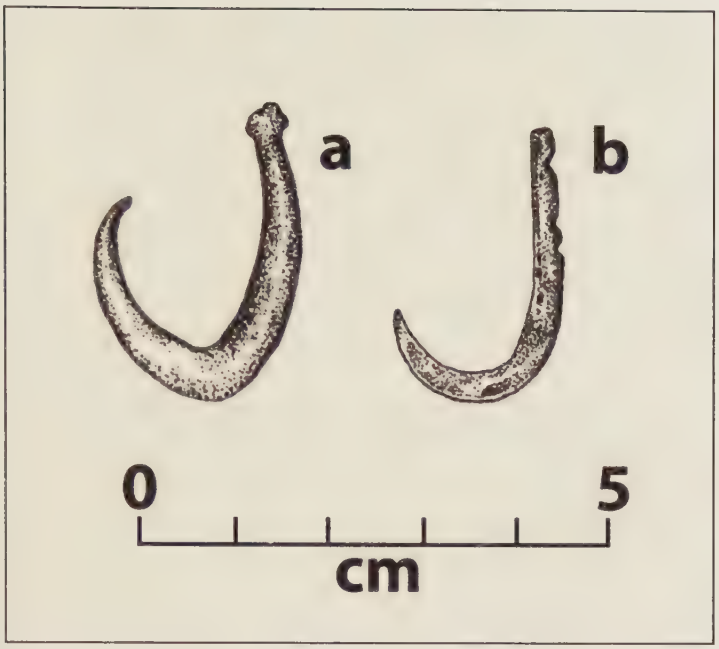


Figure 6.--Robust U-shaped fishhook (a), possibly of *Turbo* shell, from an early Pre-Latte context at Achugao, Saipan (Butler, 1995); and (b) J-shaped Latte Phase fishhook of *Isognomon* shell, from Objan, Saipan (Spoehr, 1957). Credit: Drawn by Rick Schaefer from photos.

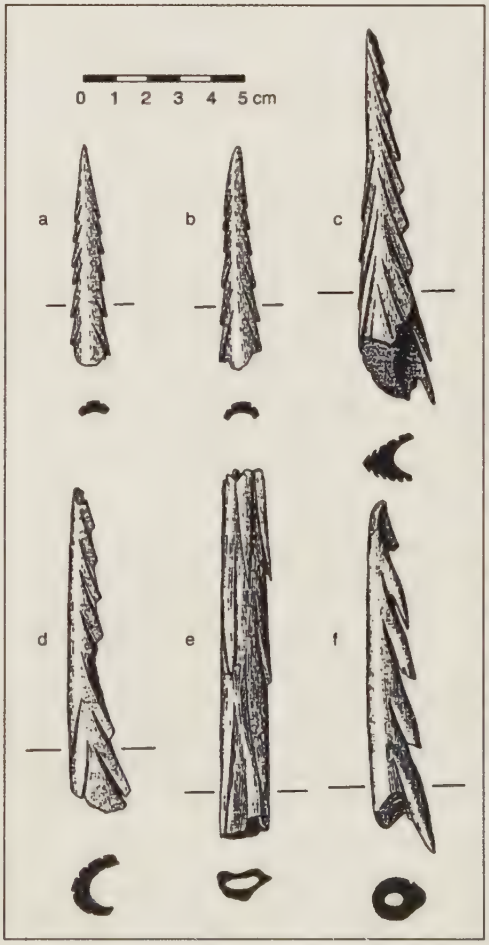


Figure 7.--Human bone spear points found in association with Burial 6 at Afetña, Saipan. Credit: McGovern-Wilson (1989).

## HISTORIC PERIOD

In contrast to the long Prehistoric Period (Table 3), the Historic Period has lasted less than 500 years from European contact until the present.

Table 3.--Prehistoric and Historic Periods in the CNMI.

| Period | Dates | Duration |
|---|---|---|
| Prehistoric Period | At least as early as 1500 BC to AD 1521 | More than 3000 years |
| Spanish Period | AD 1521-1899 | More than 300 years |
| German Period | 1899-1914 | 15 years |
| Japanese Period | 1914-1944 | 30 years |
| American Period | 1944-present | Continuing |

### Spanish Period (AD 1521-1899)

Magellan arrived in the Marianas in 1521, and Legazpi claimed the islands for Spain in 1565. More than 100 years later in 1668, Guam was colonized when the first permanent Spanish mission in the Marianas was established. Father Diego Luis de Sanvitores, a Jesuit priest and the superior of the mission arrived on Guam on June 15, 1668 (Carano and Sanchez, 1964). Along with Father Sanvitores were four other Jesuit priests, Fathers Medina, Cardeñoso, Casanova, and Morales, and a scholastic brother and lay assistants. In addition to the missionaries, there was a garrison force consisting of a captain, Don Juan de Santa Cruz, and 32 soldiers.

After an initial period of apparent success in converting the islanders to Roman Catholicism, the mission encountered hostility. Open rebellion on the part of the Chamorro against the Spaniards broke out in 1670. Father Medina was killed on Saipan in 1670, and Father Sanvitores was killed on Guam in 1672 (García, 1985). The Spanish-Chamorro Wars continued for 25 years until 1695 when the final battle took place on Aguijan (also spelled Aguiguan), where the Chamorro from Tinian had taken refuge but were finally overwhelmed by Governor Quiroga and his men.

At the end of the Spanish-Chamorro Wars, the Spanish required the natives of the Northern Mariana Islands to move to Guam. By the middle of 1699, only Saipan and Rota were still inhabited. The population on Saipan was about 600 to 700 Chamorro (Farrell, 1991). There were two churches on the island that were destroyed by a typhoon in 1705 destroyed both churches. A new church was completed by 1720, but the mission on Saipan closed in 1730. Rota was never completely depopulated, but all of the islands north of Rota were depopulated by about 1740. Until 1815, there were no permanent Saipan residents.

Refaluwasch (or Carolinian) people from the Caroline Islands to the south of the Marianas had no doubt traveled to the Marianas during the Prehistoric Period, but their visits were largely curtailed during the Spanish Period because they feared the Spaniards. In 1788, Carolinians from

Lamotrek arrived in canoes at Talofofo Bay, Guam, to trade for iron (Barratt, 1988a). This was the first such trading mission from the Carolines since the Spanish-Chamorro Wars at the end of the 17th century. The Carolinians were befriended by Luis de Torres, the son of a Spanish army officer married to a Chamorro woman. When the Carolinians departed several months later with the iron and other trade goods, they intended to return to Guam the following year, but failed to do so. They never arrived at Lamotrek, and the people there thought they had been killed by the Spanish on Guam. In 1804, Torres visited the Carolines and when he learned that the canoes had failed to return to Lamotrek, he concluded that a storm had killed the voyagers on their return. Torres invited the Carolinians to reestablish trade with the Marianas, and the trading voyages resumed in 1805.

About 1815 a typhoon devastated the islands of Satawal and Elato in the Caroline Islands (Farrell, 1991). People from those islands met at Lamotrek and moved to Saipan, where they established the village of Arabwal, later known as Garapan. Later more Carolinians from Lamotrek and Tamatam also settled in Arabwal. Official permission for the Carolinian settlement on Saipan was received from the Governor General of the Philippines in 1818. In 1839 another group of Carolinians arrived at Guam, and in 1843 the Governor General of the Philippines decided to allow them to live on Saipan. In 1851 the population of Saipan was 267, all Carolinians except for one Spanish official (Spoehr, 2000).

In 1865, 424 Carolinians and 9 Chamorro were living in Garapan (Farrell, 1991). That year Governor de la Corte proposed bringing laborers to the Marianas, and an Englishman named George Johnston began to do that. In 1865, Johnston brought 265 Carolinians from Souk to Pagan, and in 1867 he brought 604 Carolinians from Onoun to Saipan. In 1869, he brought 230 Carolinians from Piserásch to Tinian, and he also moved the people from Pagan to Saipan.

Between 1865 and 1869, Chamorro began to migrate from Guam to Saipan, and by 1869 the 459 people on Saipan included 128 Chamorro (Farrell, 1991). In 1879, some Tinian Carolinians visited Saipan and decided to start a settlement north of Arabwal (Garapan). The new settlement was called Talaabwogh (Tanapag). In 1884, Governor Olive took office and conducted a census that indicated 760 indigenous people on Saipan, 231 on Tinian, and 499 on Rota. Most of the people on Saipan and Tinian were Carolinian, but most of the people on Rota were Chamorro.

In 1886, 849 people were living in Saipan, two-thirds of whom were Carolinian (Olive, 1984:89). Two hundred thirty-five people were living in Tinian; all but 2 were Carolinian. Only 75 of the 487 people on Rota were Carolinian. In 1889, Tinian was depopulated again when Governor Solano, who followed Governor Olive, removed the Carolinians from Tinian to Saipan, where they joined the other Tinian Carolinians at Tanapag.

To summarize, a great deal of movement of people occurred within the Mariana Islands and between the Caroline Islands and the Marianas during the Spanish Period. Most of the Chamorro from the Northern Mariana Islands were moved to Guam at the end of the Spanish-Chamorro Wars. Except for Rota, which was never completely depopulated, the Northern Mariana Islands were largely uninhabited for at least 75 years from about 1740 to 1815. Beginning in 1815, Carolinians, also known as the Refaluwasch people, began to migrate to the Northern Marianas establishing the village now known as Garapan in Saipan. Beginning in 1865, Chamorro from

Guam began to migrate to Saipan, and people from the Carolines were brought as laborers to various islands in the Northern Marianas, including Pagan, Saipan, and Tinian. The Carolinians from Tinian later established the village of Tanapag in Saipan.

**Spanish-Period Fishing**

The authors of the earliest written records pertaining to the Marianas all remark on the exceptional sailing and fishing skills of the Chamorro. Magellan's historian on the first expedition to circumnavigate the globe, Antonio Pigafetta, recorded the European discovery of the Mariana Islands in March 1521 (Lévesque, 1992a:189-202). In his brief description of Guam, Pigafetta provided the following information about the islanders' food and fishing practices:

> Their food is from certain fruits called coconuts, and potatoes [either yams or taro, according to Lévesque, Editor's note 6, p. 200]. There are birds, bananas as long as one palm, sugar-cane and flying fish...The pastime of the men and women of the said place, and their sport, is to go with their canoes to catch some of these flying fish with some fish-hooks made of fish bones (Lévesque, 1992a:200-202).

Andrés de Urdaneta sailed on board one of the vessels of the Loaysa expedition, which arrived in the Marianas in 1526. Urdaneta later became an Augustinian friar and returned to the Marianas in 1565 with the Legazpi expedition. In Urdaneta's first eyewitness account (Lévesque, 1992a:453-460), he described the Marianas. "In these islands, there is no livestock whatever, no chickens, nor any other animals nor food supplies, except rice, which they have in abundance, as well as fish, coconut, coconut oil, and salt" (Lévesque, 1992a:456). In his second eyewitness account, which also covered the 1526 stop in the Mariana Islands (Lévesque, 1992a:461-469), Urdaneta remarked on the islanders' use of tortoise shell and their ability to fish. "As for tortoise shells, they praise them very much for making combs and hooks to fish with...As for fish, they kill many with hooks" (Lévesque, 1992a:465-466).

Pelagic fishing during the Prehistoric Period and the first 200 years of the Spanish Period depended on the flying proa, the large ocean-going sailing canoe. An idea of the number of proas comes from a narrative of Legazpi's voyage attributed to Father Martin Rada. Rada reported that more than 400 proas surrounded Legazpi's ships anchored at Umatac, Guam in 1565. He said, "It certainly is something to see how fast they sail and how easily they change direction" (Lévesque, 1992b:158). Rada also described a boathouse in the village of Umatac that could hold 200 men.

Both Urdaneta and Rada made statements to the effect that there were no large mammals or even chickens in the Marianas in 1526 or 1565. Rada (Lévesque, 1992b:164) wrote, "No-one was found who ate or had any kind of meat, any wild or domestic cattle, any birds whatever except a few turtle doves that they kept in cages."

Just before the end of the 16th century and at the beginning of the 17th century, religious zealots jumped ship in the Mariana Islands to convert the islanders to Roman Catholicism. Other Spaniards were shipwrecked in the Marianas. Their longer tenure in the islands allowed them to learn more of the customs of the Chamorro. A lay brother named Fray Juan Pobre de Zamora jumped ship at Rota and spent 7 months there in 1602. While in Rota, he was visited by another Spaniard named Sancho, who had survived the shipwreck of the *Santa Margarita* in 1601 and had become the servant of a Chamorro named Suñama, who lived at Pago, Guam.

Sancho described how the Chamorro fished for flying fish and used it as bait for mahimahi, billfish, and other large fishes.

> When they fish for these flying-fish, those from one town all come together in a bunch and they go out in their canoes, each one with from ten to twelve gourds; to each gourd is tied with a very slim cord a small two-pointed shell hook [probably an *Isognomon* gorge]. One hook is baited with coconut meat and the other with shrimp or some minnow from the sea. All the fishermen throw these gourds into the sea together, everyone taking care of his own. It is by watching the gourds and seeing them wiggle that they know they have a flying-fish. There are so many fishermen because all those living on the coast of all the islands are fishermen. There are flying-fish for all of them as there are sardines in Spain. The average fish measures about one palm in length, and others about two. The first flying-fish they catch, they then eat it raw. The second one is placed as a bait on a large hook and the cord is thrown over the poop and in this manner they usually catch many dorados [mahimahi], swordfish, and other big fishes (Lévesque, 1993:176, brackets added).

Sancho told the following fish story about his master Suñama to Fray Juan Pobre. Suñama caught a flying fish and ate the first one raw. With the second flying fish, he baited his hook and hooked a very large billfish (probably a blue marlin) and spent a great deal of time playing the fish to tire it. A large shark came and seized the billfish. When Suñama did not let go of the line, his boat capsized. He tied his line to the capsized boat and followed the line to the shark, diverted the shark, then brought the billfish back to his boat, which he righted and sailed home flying a woven mat from the masthead to indicate a successful catch. Sancho concluded that the Chamorro were "the most skilled fishermen ever to have been discovered" (Driver, 1983:15).

Apparently the first large land mammals in the Marianas arrived with the priests and soldiers in 1668. Brother Marcelo Ansaldo, who did not remain on Guam but continued on to the Philippines, wrote about Father Sanvitores' landing on Guam: "A moment of intense surprise and interest was when our sailors brought ashore rams, sheep, a little bull, a cow and three parrots which are to stay here. The *indios* had never seen any of these animals before so they greatly marveled at seeing them" (Rogers, 1995:47). In addition to the cattle and sheep mentioned by Ansaldo, the Spanish introduced horses, carabaos, pigs, goats, and deer during the remainder of the 1600s and the 1700s. It is possible that the precontact Chamorro had pigs, but there is no unequivocal archaeological evidence.

During the Spanish-Chamorro Wars (1670-1695), the Spanish burned Chamorro villages and boats, overtook canoes that attempted to flee from Guam to Rota, and rounded up fugitives on Rota who had fled from Guam (García, 1985). The years of war and the policy of moving the Chamorro from the Northern Marianas to Guam eventually put a stop to interisland travel and pelagic fishing by the Chamorro.

The flying proa, which first had been described in the 1500s, was seen and described by William Dampier in 1686 (Dampier, 1937), Captain Woodes Rogers in 1710 (Rogers, 1928), and George Anson in 1742 (Anson, 1748; Barratt, 1988b). Anson and some of his lieutenants captured a proa on their arrival at Tinian, later dismantled it, and then burned it before they left the island (Barratt, 1988b:11, 14, 69). Their descriptions and drawings of the proa are among the last in history (Fig. 8).

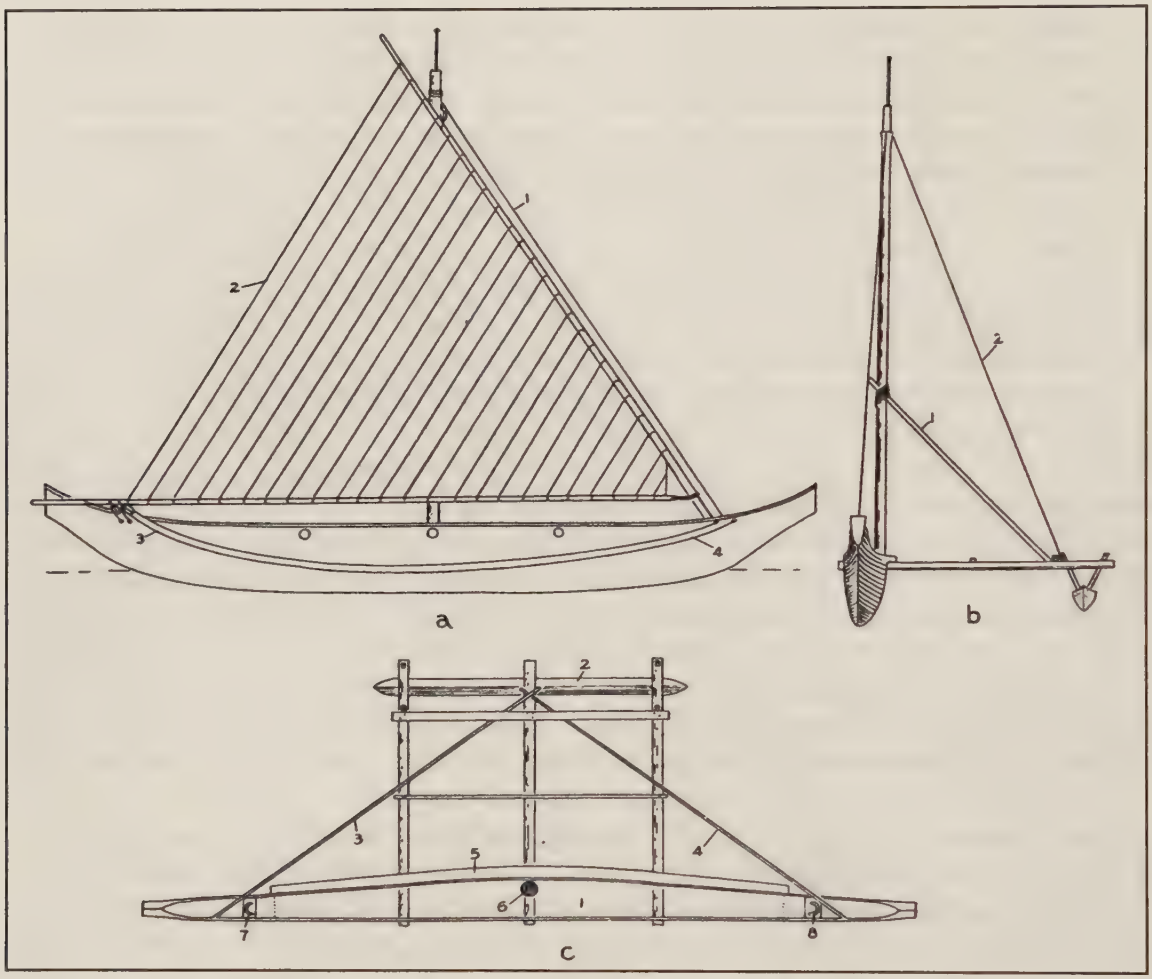


Figure 8.--"Flying proa" of the Mariana Islands. a) view from leeward with sail set: 1, one of two stays supporting mast, the other hidden behind sail; 2, matting sail; 3, 4, running stays. b) head view, outrigger to windward: 1, mast shore; 2, shroud. c) plan: 1, proa; 2, "boat" at end of outrigger frame; 3, 4, braces from the ends to steady frame; 5, thin plank placed to windward to prevent shipping of water, to serve as seat for native who bales, and sometimes as rest for goods transported; 6, part of middle outrigger boom on which mast is fixed; 7, 8, horseshoe sockets, in one of which yard is lodged according to tack (after Anson 1748). Figure and caption from Hornell (1975:414).

Anson had arrived at Tinian more than 40 years after the Chamorro had been moved to Guam and found no permanent population there. Instead, he encountered a party of about two dozen men, islanders under the command of a Spanish sergeant, who had come from Guam to kill and cure beef for the garrison in Guam and for the Spanish galleon, which would stop on her way from Acapulco to Manila. The Anson expedition estimated the number of cattle on Tinian at 10,000 and an abundance of wild hogs and domestic poultry (Barratt, 1988b:46).

Hornell noted that the last voyager to describe the flying proa of the Chamorro was Captain Crozet, who spent nearly 2 months on Guam in 1772. However, Hornell questioned Crozet's description because it "coincides so closely with that of Dampier that it is impossible to resist the conclusion that Crozet had Dampier's account before him as he wrote and that he based his own almost entirely upon it" (Hornell, 1975:417). As proof of his conclusion, Hornell cited the fact that Crozet repeated Dampier's error in saying that the outrigger was on the lee side of the boat, rather than the windward side, as correctly reported by other writers. A footnote in Crozet (1891:96), added by the translator H. Ling Roth, says that Dumont D'Urville wrote that at the time of his first visit to the Mariana Islands in May 1828, the islanders were no longer able to make these canoes and instead used similar ones from the Carolines. This statement was confirmed to Roth in August 1888 by Vice Admiral E. Paris, who had been a midshipman with D'Urville.

It appears that Anson was the last European visitor to see the proa in use, and even then it was put to the unusual use of transporting meat from Tinian, rather than pelagic fishing. Pelagic fishing by the Chamorro apparently came to an end by about 1750 if not before. When Governor Henrique Olavide took office in 1749, he noted a lack of seagoing vessels. He had three 30-ft vessels built in Guam, and he had 11 *bancas* (seagoing canoes) built for interisland travel—6 in Guam, 4 in Rota, and 1 in Tinian (Driver, 2005:37). Governor José de Soroa, who took office in 1759, sent *bancas* to Tinian for meat (Driver, 2005:38). During Governor José Arlegui's administration (1786-1794), several disasters highlighted the importance of the Carolinians and their oceangoing canoes (Driver, 2005:54-57). By this time, interisland travel was dependent on the Carolinians. The Carolinian *bancas* traveled from Guam to Rota for purposes of the government and church, and they traveled to Tinian to obtain meat and produce. No doubt both Chamorro and Carolinians, wherever they lived in the Mariana Islands, continued to fish for reef fish.

The Freycinet expedition, which arrived at Guam March 17, 1819, was a French scientific expedition that spent several months in the Marianas, visiting Tinian and Rota as well as Guam. Freycinet (2003) provided a lengthy and detailed account of the tools and techniques of fishing in the Marianas. He described the methods of fishing for *mañåhak* (juvenile rabbitfishes, *Siganus* spp.), *hachuman* (*Decapterus* sp., *opelu* in Hawai'i), parrotfishes (family Scaridae), flying fishes (family Exocoetidae), *anaho* (probably mahimahi, *Coryphaena hippurus*) and other marine resources including turtles.

Freycinet (2003:163) reported that *mañåhak* were caught regularly during the months of April, May, and June, and rarely in September and October, but only at the time of the moon's last quarter. *Mañåhak* that appeared during the fall months were called *magnahak ababa* or crazy

*mañåhak*, because they appeared only about once every 25 years. Freycinet said these fishes were "seen in most extraordinary numbers and vast shoals."

Two species of *mañåhak* occur in the Marianas. The smaller fish are *Siganus spinus* (Linnaeus) and the larger are *Siganus argenteus* (Amesbury and Myers, 1982). The smaller fish appear first and then the bigger ones, sometimes on the same day or on subsequent days. The appearance of larger species indicates the run is coming to a close. People in the Marianas still fish for *mañåhak* during the seasonal runs.

*Hachuman* were caught with the use of the *poiu* or fishing stone (Photo 4), which is a type of chumming device. The stone was hemispherical and flat on top. A coconut shell cap about the same size as the stone was attached to the flat top with cords to hold the two pieces together. Chewed coconut meat was placed inside the coconut shell cap, and the device was used to attract fish toward the surface where they could be taken in a net, known as the *lagua atchuman* Freycinet (2003:164) said *hachuman* were caught beyond the reefs, one-half league to five leagues from land. The fishing began in August and continued until October when the fish were full grown. The fisherman filled a *poiu* with the chewed pulp of a young coconut and lowered the device on a line to a depth of 6 to 8 fathoms [36-48 feet]. The fisherman shook the line from time to time to disperse the coconut meat into the water. The *hachuman* came in great numbers to eat the coconut. When the *poiu* was empty, the fisherman took it out, refilled it, and continued the operation until evening. The following morning, the fisherman returned to the same spot, but this time he lowered the *poiu* 1 or 2 feet less deep than the previous day. He did this each day for 1.5 or 2 months except during bad weather. By this time the *hachuman* were almost surfacing. Ordinarily, this fish was caught at a depth of 1 fathom [6 feet]. Estanislao Taisacan, a fisherman on Rota (below), still uses the *poiu* to fish for *hachuman*.

In the section on fishing law, Freycinet (2003:189) said that a *hachuman* fisherman would sometimes throw his *poiu* into the water while crossing several fishing grounds. The fish would follow his canoe, and when he arrived at his own ground, he would have a better catch. However, if the fisherman were caught doing this, he would receive the death penalty.

Freycinet (2003:165) described two types of fishing for parrotfishes. One took place at night and the other by day. The nighttime fishing occurred after the new moon in the months of August through November. After sunset, when the tide was low and the sea was calm, a canoe went out with a man in front holding a torch. The light of the torch permitted the fishermen to see the parrotfishes sleeping near the outer edge of the reef. Previously, the fishermen carried a barbed wooden spear, but by Freycinet's time, they used the multiprong iron spear to retrieve the fishes.

Photo 4.--Ancient *poiu* or fishing stone made of argillaceous limestone and refitted with lines and coconut shell. Photo Credit: Frank Wells.

The daytime fishing for parrotfishes involved the use of a live fish as a decoy. The live parrotfish had a line attached through its lower jaw. The fisherman carried the fish in his canoe to an appropriate place where there were natural basins formed by corals inside the reefs. The fish was put into the water and allowed to swim as far as the cord extended. The other parrotfish saw the captive fish and hurried to attack it. The fisherman then removed the decoy fish from the water and made a sliding knot near the spot where the fish was wounded. When the decoy fish was placed back into the water, the other fish attacked the bleeding spot, and the fisherman pulled the noose around the attacking fish. Freycinet reported that a skilled fisherman would not catch more than six or eight parrotfish per day in this way. The live decoy could be kept in water near the shore and used for a week.

Freycinet's description of fishing for flying fishes (Freycinet, 2003:166) is much the same as that provided by Sancho to Fray Juan Pobre (above). A special arrangement of lines and hooks known as *kinatchit gumahga* was used. The main line was held afloat by gourds (*taguadji*), and lateral lines were attached to it at intervals of 1 or 1.5 fathoms. Both Freycinet and Fray Juan Pobre noted that in the past the fishhooks were made of shell, but by early Spanish times were made of iron.

Freycinet (2003:166) also mentioned fishing for what he called *l'anaho.* The addition of the word *dorado* indicates that he was talking about mahimahi (*Coryphaena hippurus*). The content of Freycinet's description also indicates he was talking about mahimahi, because he said the fish was caught using a recently killed flying fish. However, Freycinet said that this fish was taken

formerly. Apparently no one was fishing for mahimahi at the time Freycinet was in the Marianas.

Freycinet (2003:166) reported that the islanders had no method for catching turtles other than tipping them over onto their backs.

Freycinet included a description of the Chamorro sailing canoes written by Gemelli Careri, who saw them in 1696, just after Spanish conquest, when the canoes were still being built. Freycinet concluded that the craft of the Mariana Islanders of old were similar to those of the Carolinians still used in Freycinet's time. He said, "The craft used nowadays to make crossings from one island to another are of Carolinian construction, and they are even manned by natives of those islands, rather than by natives of the Marianas" (Freycinet, 2003:178). Freycinet was in the islands in 1819, soon after the Carolinians began to move to the Marianas about 1815.

Two Spanish governors of the second half of the 19th century described fishing. Governor Felipe María de la Corte y Ruano Calderón, who served as governor from May 1855 to January 1866, said that there was no pelagic fishing. "In the contiguent seas there are considerable large fish, but as the natives never go fish them beyond the reef few fish are caught" (de la Corte, 1970:143). But he described the fishing for three seasonal fishes: 1) *mañåhak*, which de la Corte spelled *atañaja* (juvenile rabbitfishes, *Siganus* spp.); 2) *ti'ao* (juvenile goatfishes, family Mullidae); and 3) *atulai*, which de la Corte spelled *atislai* (big-eye scad, *Selar crumenophthalmus*).

De la Corte (1970:144) said the *mañåhak* "come in through the reefs at low tide in some moons of May to July and sometimes come in compact layers of 5 and 6 feet thick and many braces wide and long. The town comes out in mass to catch all they can in small nets and sometimes this lasts two or three days each moon. This fish is tasty and besides eating it fresh, they pickle it and keep it the whole year round." The *ti'ao*, he said, "also comes in shoals, but not as big as those of the *atañaja* [*mañåhak*]. They turn up around April to August."

Concerning the *atulai*, de la Corte (1970:144) said, "Some shoals of fish like mackerel or large sardines also appear which are called *atislai* and they catch them in the same way, but they do not come in such great abundance nor every year. They are caught during the moons of June to August and are eaten like the others, fresh and pickled." *Atulai* are still caught in the Marianas.

De la Corte's description of *hachuman* fishing (de la Corte 1970:144-145) is quite similar to Freycinet's, except that he said the fish are fattened for 1 to 3 months. He also quantified the catch, "With this operation they sometimes catch more than a ton of fish a day, and repeat the fishing for a month, around August." However, he added, "As this requires a certain amount of patience, perseverance and experience, only certain old men practice this, and I do not think anybody does so nowadays. This practice seems to have originated from the old natives." It appears that de la Corte never saw catches of a ton per day, but he had been told that was the size of the catch in the past.

Concerning navigation, de la Corte (1970:146) remarked, "In spite of the fact that on their discovery these natives created a reputation as good navegators [sic], and notwithstanding the

fact that they individually have a good disposition as sailors, they do not at present exercise it whatsoever, on the island since there is no boat capable of making a trip even to the nearest route." He reported there were three or four boats or "whale hunters' canoes" used for transporting goods from the harbor to Hagåtña or for carrying unmilled rice from Inarajan or Merizo at harvest time. He said the islanders used small canoes or "*galquides*" [*galaides*] for fishing, but added, "they are so small, they cannot be used for anything other than going between the reefs, and thus nobody fishes beyond them." He said that in 1863 there were only 24 of these small canoes and concluded, "Consequently, we can say there is no navegation [sic] of any kind on the island."

Governor Francisco Olive y García's notes (1984) pertain to the years 1884-1887. The section of his report concerning fishing is almost item for item the same as de la Corte's. He described the same seasonal runs for *mañåhak*, *ti'ao*, and *atulai*, as well as the fishing for *hachuman*. The similarity to de la Corte's descriptions leads one to conclude that Olive copied them from de la Corte. Olive added that the *hachuman* fishing was still done on the island of Rota, saying "we believe this is practiced only by an occasional person, especially on the island of Rota" (Olive y García, 1984:34). Concerning turtles, Olive (1984:34) said, "There are turtles—but no tortoise shell."

## German Period (1899-1914)

Just prior to the beginning of the 20th century, Spain lost control of the Mariana Islands, and the histories of Guam and the Northern Mariana Islands diverged (Fig. 5). Guam was ceded to the U.S. in 1898 as a result of the Spanish-American War, and in 1899 Germany purchased the Mariana Islands north of Guam, beginning the German Period (Fig. 9).

Georg Fritz, the first district officer for the German Northern Marianas, arrived on Saipan and took office on November 17, 1899. He established public education and a police force and undertook public health programs and public works projects. His programs brought the Chamorro and Carolinians on Saipan into regular contact with each other (Farrell, 1991). Prior to this, the two groups had lived separately. During Fritz's administration more than 100 Carolinian people from the Maria Cristina barrio on Guam were moved to Saipan. The 1902 census found 2402 people living in the Northern Marianas (Table 4). In 1904, Fritz wrote a history and ethnography of the Chamorro people entitled *Die Chamorro* (Fritz, 2001).

Copra production was the main economic interest of the Germans in Micronesia, and Fritz promoted the copra industry. He enlisted prisoners, school children, and public workers to plant coconuts, and 50,000 coconut trees were planted on Saipan (Farrell, 1991). Copra exports more than doubled in 2 years from 400 tons in 1901 to 900 tons in 1903. Fritz established a homestead program to bring workers to the Northern Marianas, and many Guam Chamorro relocated. The population of the Northern Mariana Islands increased by 30% between 1900 and 1905. However, three typhoons struck the islands in 1905, and economic development slowed.

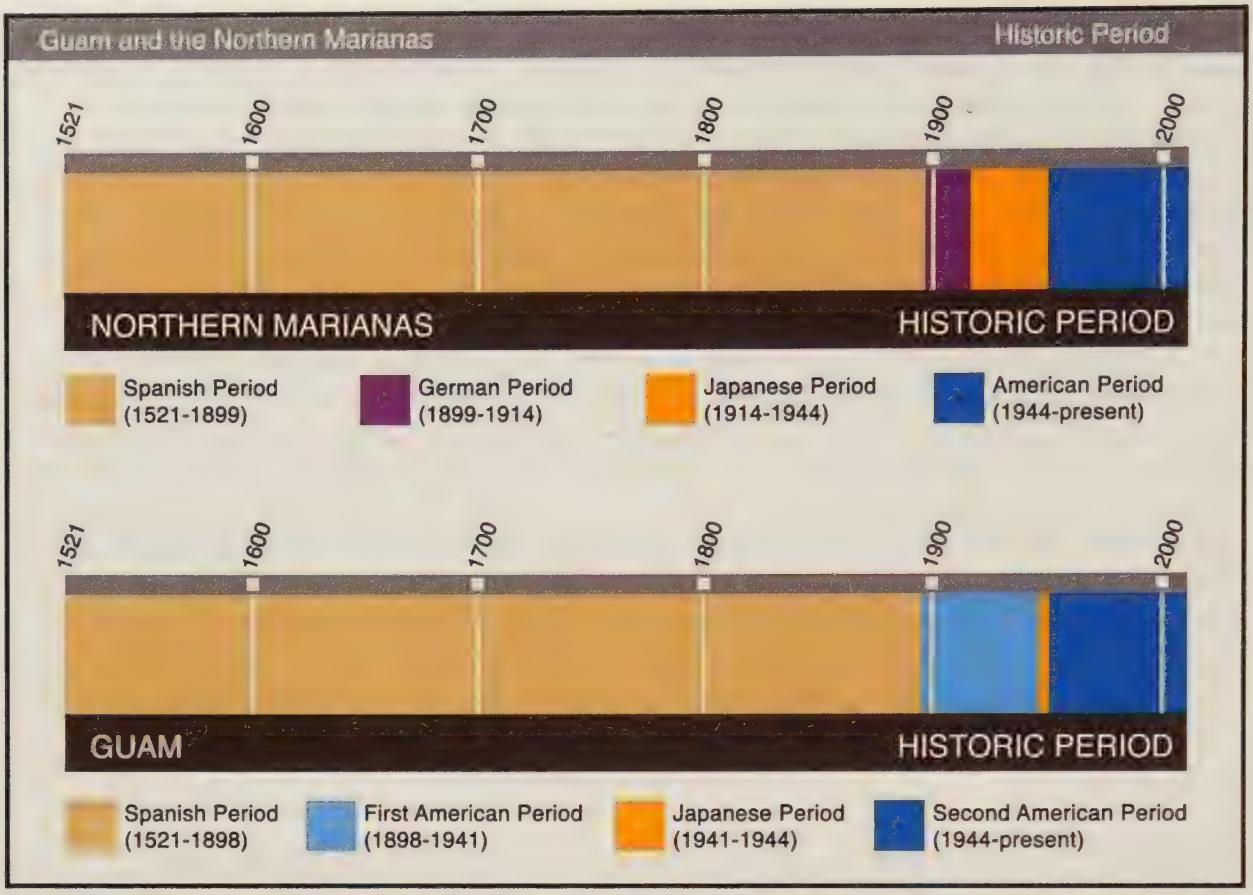


Figure 9.--Timelines of the Historic Period in Guam and the Northern Mariana Islands. Credit: Robert Amesbury.

Table 4.--Population of the German Northern Mariana Islands as of April 1, 1902 (Fritz, 2001).

| Island | Village | Chamorro | Carolinians | Foreigners | Total |
|---|---|---|---|---|---|
| Rota | | 440 | 49 | 1 | 490 |
| Tinian | | 36 | 59 | 1 | 96 |
| Saipan | | | | | 1631 |
| | Garapan | 891 | 524 | 42 | |
| | Tanapag | 76 | 97 | 1 | |
| Sarigan | | 7 | 1 | 0 | 8 |
| Alamagan | | 6 | 2 | 0 | 8 |
| Pagan | | 35 | 102 | 0 | 137 |
| Agrihan | | 14 | 18 | 0 | 32 |
| **TOTAL** | | **1505** | **852** | **45** | **2402** |

The German Period was the shortest of the colonial administrations of the Northern Marianas. It ended at the beginning of World War I. On October 14, 1914, Saipan was seized by Japan. The Germans offered no resistance, and no blood was shed.

## German-Period Fishing

Fritz's 1904 history and ethnography of the Chamorro recorded the customs of the turn-of-the-century Chamorro and, to a lesser extent, the Carolinians of the Northern Marianas. Concerning fishing, Fritz (2001:68) wrote, "Naturally, fishing provides the main source of food for the island inhabitants. However, fishing takes place only inside the reef. Only the Carolinians sometimes go on the high seas to visit Aguiguan [or Aguijan] 25 sea miles away from Saipan, and dive for trepang (*balate*) which they sell to the Japanese. They also catch turtle (*haggan*) and utilize weir traps inside the reef, a fishing technique not practiced by the Chamorros."

By Fritz's time, the Chamorro no longer built or sailed the flying proas. Fritz (2001:73-74) wrote

> With the demise of the brave [Chamorro] nation, these ocean craft disappeared. Only the Carolinians who migrated to the Marianas in the 19th century, whose canoes and sails had the same form and construction as the canoes from the Marianas, resumed the traffic among Guam, Rota, Tinian and Saipan. [These voyages were stopped as a result of Spanish] government policy because of a few accidents. The last *sagman* is supposed to have arrived in Guam from Saipan in 1892.

According to Freycinet (2003:178), *sagman* is the Chamorro word for the largest proas. Fritz did not state clearly whether the last *sagman* to sail from Guam to Saipan in 1892 was sailed by Chamorro or Carolinians, but it appears that he meant it was sailed by Carolinians. He said the Chamorro oceangoing craft disappeared with the demise of their nation, which took place as a result of Spanish conquest in 1695, and that the Carolinians resumed the interisland traffic in the 1800s. Fritz (2001:74) said, "The Chamorros now use - solely for fishing within the reef - outrigger canoes made of *dugdug* [seeded breadfruit, *Artocarpus mariannensis*] or *lemai* [seedless breadfruit, *Artocarpus altilis*]. They are from three to six meters in length and are called *galaide*." (English names and species names of breadfruit added by J. Amesbury).

Fritz (2001:68) reported that the Chamorro used mainly nets for fishing, and he described three types of nets. The *talaya* is a round throw net, 4 meters in diameter, with lead weights around the perimeter. The fisherman throws it in such a way as to completely surround a school of fish seen from the shore. He then pulls the net to shore. If a large fish is netted, the fisherman jumps into the water and kills the fish by biting it. The fisherman can throw the net a distance of about 8 meters.

Fritz provided four Chamorro names of fishes caught with the *talaya*. Three of the four are identified in the editor's notes as follows: *kichu* (*Acanthurus triostegus*, convict tang), *guili* (*Kyphosus cinerascens*, rudder fish) and *laiguan* (*Valamugil seheli*, mullet). According to Amesbury and Myers (1982:123), *laiguan* refers to the large individuals of at least four species of the family Mugilidae (*Chelon engeli*, *Crenimugil crenilabis*, *Liza vaigiensis*, and *Neomyxus leuciscus*). The fourth fish that Fritz said is caught with the *talaya* is *ti'ao* (juvenile goatfishes, family Mullidae).

The second net described by Fritz (2001:68-69) is the *lagua*. It is 5 meters long and 1.7 meters wide, with lead weights on the bottom edge and on the top edge, floats of light wood, such as hibiscus or breadfruit. The sides are fastened to poles. This description is similar to Freycinet's (2003:161) description of the *lagua pula.*

A group of 12 to 15 women and young men gather to use the *lagua*. One person stands at each side with the poles. One person holds the net in place while another one stretches the net in the direction of a school of fish. The remaining participants rush toward the net, shouting and splashing to drive the fish toward the net. Then they grab the weights along the bottom edge and raise them in order to catch the fish in the net. Fritz said the net was sometimes made of locally spun cotton but more commonly from imported net twine. Daytime fishing with the *lagua* is called *lalago*; nighttime fishing with the *lagua* is called *gumade*.

The third net Fritz described (2001:69) is the *chentchulo*, a surround net up to 200 meters long and 3 meters wide, made of imported hemp. Up to 40 participants take the net in two boats to a good location, preferably a small bay. Each boat takes half the net and goes in opposite directions, letting the net slide into the water. After the entire net is in the water, both boats row with haste to the shore, and the crews pull the net and catch onto the beach. Fritz (2001:70) gave the Chamorro names of eight fishes caught with the *chentchulo*.

Sometimes at low tide, a closed in area of rocks is built as a trap near the reef. At high tide, the *chentchulo* is stretched around the wall, and the fish are caught in the trap. They are grasped by hand or speared with the two-pronged iron spear (*fiska*). Daytime fishing with the *chentchulo* is called *chentchulo haane*; nighttime fishing is called *chentchulo-painge*.

Fritz (2001:70) also described a kind of fishing called *lumulai*, which takes place during full moons. This fishing is done with an iron hook (*haguet*). The hook is baited with small fish or crabs and hung in a hole on the reef. Another type of fishing, called *sumulo*, takes place at night during low tides using torches (*haéf*, the dry sheath of the coconut flower). The fish or crabs are grabbed by hand or speared.

Fritz (2001:71-73) said that two of the types of fishing described by Freycinet, the *hachuman* fishing with the fishing stone and the *låggua* (parrotfish) fishing with a decoy fish, take place only on Rota. Fritz (2001:73) described the use of fish poison, also described by Safford (1905) on Guam, and the use of fish weirs (*gigao*), described by Freycinet (2003). Turtles, he said, are caught by hand, and sometimes a female turtle is used to lure other turtles.

Fritz (2001:68) reported that women and children dig for clams and snails. He provided six Chamorro names for mollusks. Crabs, he said, are caught by hand, and lobsters are speared with the *fiska*.

## Japanese Period (1914-1944)

After the Japanese takeover in 1914, the Northern Marianas became one of six Japanese naval districts of Micronesia. Other districts were Palau, Yap, Chuuk, Pohnpei, and Jaluit in the Marshall Islands. When World War I ended, the League of Nations gave Japan the mandate over Micronesia. Japan resigned from the League of Nations in 1933 but continued to govern the Northern Marianas as part of the Japanese Empire. Many Japanese, as well as Okinawans and Koreans, occupied the Northern Marianas. Japan's policy was to assimilate the Chamorro and Carolinians into the Japanese culture. In 1935, when the indigenous population of the Northern Marianas was less than 5000 (Table 5), there were nearly 40,000 Japanese, Okinawans, and Koreans living in the Northern Marianas (Table 6).

Table 5.--Indigenous population of the Northern Mariana Islands during the Japanese Period.

| Year | Rota | Tinian | Saipan | Northern Islands | Total |
|---|---|---|---|---|---|
| 1920 | 651 | 112 | 2,449 | 186 | 3,398 |
| 1925 | 487 | 180 | 2,639 | 187 | 3,493 |
| 1930 | 644 | 43 | 2,915 | 227 | 3,829 |
| 1935 | 788 | 24 | 3,194 | 291 | 4,297 |

Table 6.--Number of Japanese, Okinawan, and Korean people in the Northern Mariana Islands in 1935 (Farrell, 1991).

| Island | Number of Japanese, Okinawans, and Koreans |
|---|---|
| Rota | 4,841 |
| Tinian | 14,108 |
| Saipan | 20,280 |
| Anatahan | 3 |
| Alamagan | 4 |
| Pagan | 89 |
| Agrihan | 2 |
| **TOTAL** | 39,327 |

What copra was to the Germans, sugarcane was to the Japanese. During World War I, the price of sugar soared, and two Japanese companies began planting sugarcane on Saipan. When the war ended, the price of sugar dropped, and the companies failed. But in 1920 a Japanese man named Haruji Matsue, who had graduated with a degree in agriculture from Louisiana State University, visited Saipan and decided he could successfully grow sugarcane there (Farrell, 1991). He formed the Nanyo Kohatsu Kaisha (NKK or South Seas Development Company) and brought in Okinawans to grow the sugarcane. He built a narrow-gauge railroad line to carry the cane to the factory in Chalan Kanoa, Saipan. In 1926, Matsue gained an exclusive lease on the entire island of Tinian, which eventually produced 50% more sugar per year than Saipan. In 1930, the NKK began developing Rota, where they found phosphate deposits and began mining operations.

By the late 1930s, Japan had begun a military buildup in the Northern Marianas. On December 8, 1941, just a few hours after the bombing of Pearl Harbor in Hawaii, Japanese planes took off

from Aslito Field on Saipan to bomb Guam. The American governor of Guam surrendered to the Japanese on December 10, 1941, and all of the Marianas remained under Japanese control until 1944.

In 1944, U.S. forces fought their way across the Pacific toward Japan. The American pre-invasion bombing of Saipan and Tinian began on June 11, 1944 (Denfeld, 1997). After days of bombarding Saipan from air and sea, American troops landed there on June 15. Weeks of intense fighting with heavy losses on both sides culminated in the Americans officially declaring Saipan secure on July 9, 1944.

The naval bombardment of Tinian was accelerated on July 22 and 23, and the 4th Marine Division made a surprise landing at Unai Babui and Unai Chulu (known at White One and White Two to the Marines) on northwest Tinian on July 24, while the 2nd Marine Division staged a fake landing at Tinian Town to draw the attention of the Japanese. Tinian was declared secure on August 1, 1944.

Guam had been invaded by the Americans on July 21 and was declared secure on August 10, 1944. Rota and the islands north of Saipan remained in Japanese hands until the end of the war.

**Japanese-Period Fishing**

Beginning in the 1920s and ending in 1944, the Japanese operated a pole-and-line fishery out of Saipan, which was the first large scale commercial fishery in the Marianas. Table 7 shows the Japanese pole-and-line catch of bonito (skipjack tuna) and tuna (probably yellowfin tuna) from Saipan District for the years 1922 through 1941. Higuchi (2007) referred to the years 1922-1931 as the "Experimental Period," and the years 1931-1941 as the "Rise of Fishing Industries." The bonito catch peaked in 1937 at more than 8,000,000 pounds. Tuna peaked in 1936 at more than 330,000 pounds.

The Japanese pole-and-line fishery employed Japanese and Okinawan people, and most of the fish were shipped to Japan. According to Bowers (2001:189), "No natives were employed in the industry, neither on the boats nor in processing plants, and native fishing continued in its traditional function of providing day-by-day food supply." The local people were involved in reef fishing for subsistence. However Alfonso C. Reyes, who was born on Saipan in 1924 and interviewed there in 2005, was quite clear in stating that some local people were employed by the Japanese in the tuna fishery (Amesbury and Hunter-Anderson, 2008).

Toward the end of the war, the Japanese fishing boats were unable to leave Saipan lagoon because of American submarines. At that time, they fished inside the lagoon using dynamite (Bowers, 2001:30). The American invasion of Saipan brought an end to the Japanese fishing industry there. "American attack on the islands completely wrecked the Japanese fishing industry. All shore installations were destroyed and the boats either sunk in the harbor or beached and destroyed by fire" (Bowers, 2001:189).

Table 7.--Bonito (skipjack tuna) and tuna (probably yellowfin tuna) from Saipan District, 1922 through 1941 (Higuchi, 2007).

| Year | Bonito (metric tons) | Bonito (1000 pounds) | Tuna (metric tons) | Tuna (1000 pounds) |
|---|---|---|---|---|
| 1922 | 2.4 | 5.2 | 1.3 | 2.9 |
| 1923 | 2.8 | 6.2 | 1.3 | 2.8 |
| 1924 | 9.1 | 20.1 | 1.5 | 3.4 |
| 1925 | 14.8 | 32.6 | 1.4 | 3.1 |
| 1926 | 44.8 | 98.9 | 2.3 | 5.1 |
| 1927 | 28.1 | 62.0 | 2.9 | 6.4 |
| 1928 | 26.5 | 58.4 | 1.3 | 2.8 |
| 1929 | 24.7 | 54.4 | 0.6 | 1.2 |
| 1930 | 258.0 | 568.8 | 4.5 | 10.0 |
| 1931 | 564.3 | 1,244.0 | 16.7 | 36.9 |
| 1932 | 1,309.7 | 2,887.4 | 48.2 | 106.4 |
| 1933 | 1,762.3 | 3,885.2 | 9.6 | 21.1 |
| 1934 | 2,516.0 | 5,546.8 | 27.3 | 60.2 |
| 1935 | 1,786.0 | 3,937.4 | 42.9 | 94.6 |
| 1936 | 1,696.0 | 3,739.1 | 151.0 | 332.9 |
| 1937 | 3,697.3 | 8,151.1 | 88.9 | 195.9 |
| 1938 | 2,592.0 | 5,714.4 | 33.9 | 74.8 |
| 1939 | 1,297.4 | 2,860.2 | not available | not available |
| 1940 | 3,379.0 | 7,449.5 | 84.5 | 186.3 |
| 1941 | 1,297.4 | 2,860.2 | 33.7 | 74.2 |
| **Average** | **1,115.4** | **2,459.1** | **29.1** | **64.3** |

In an article published in the *Guam Recorder* in 1931, Hans G. Hornbostel confirmed that the fishing stone, the *poiu*, originally described by Freycinet (2003), was still in use on Rota. Hornbostel's description of *hachuman* fishing varied little from Freycinet's. Hornbostel's article verified Fritz's (2001) statement that this ancient type of fishing was preserved on Rota.

## American Period Post-War (1944 – 1979)[3]

Before the end of the war, Saipan, Tinian, and Guam all became important American military bases. Saipan was the staging area for the invasion of Iwo Jima in February 1945, and Tinian became the largest operational airbase in World War II (Farrell, 1991). It was from Tinian that the American B-29s *Enola Gay* and *Bock's Car* carried the atom bombs that were dropped on Hiroshima and Nagasaki on August 6 and 9, 1945.

From 1944 to 1947, the U.S. Naval Military Government administered the Northern Marianas. The Chamorro and Carolinians were considered liberated people. Japanese and Okinawans were

[3] The American period continues to the present, but for clarity we are discussing 1980 to the present as a separate chapter.

treated as citizens of an enemy nation, while the Koreans and Chinese were treated as citizens of countries that would regain their sovereignty after the war.

On Saipan, a camp was built for the Chamorro and Carolinians at Lake Susupe, and separate camps were built for the Koreans and for the Japanese and Okinawans. The Chamorro from Tinian were brought to Saipan. Before the end of 1944, the Chamorro and Carolinians were relocated to Camp Chalan Kanoa, where they remained until July 4, 1946.

As of April 1945, the population of Saipan, excluding military personnel, was 17,974 (2426 Chamorro, 810 Carolinians, 13,373 Japanese and Okinawans, and 1365 Koreans) (Farrell, 1991). By the end of the war in September 1945, Camp Churo on Tinian held 11,479 people, none of whom was Chamorro or Carolinian. In September 1945, about 500 Chamorro and Carolinians were brought to Saipan from Pagan, Agrihan, Asuncion, and Alamagan. The Chamorro on Rota remained there.

At the end of the war, nearly 50,000 Asian civilians lived in the Marianas. All Japanese were returned to Japan. Okinawans were given the option to remain in the Marianas, and originally several thousand wanted to stay and live on Tinian. However, most changed their minds, and by the end of 1946 all Asian civilians had been repatriated. The American military personnel also left Tinian in 1946, leaving that island unpopulated for the third time in the Historic Period. By 1950, all U.S. military installations on Saipan had been closed as well.

Between 1945 and 1948, many Chamorro returned to the Northern Marianas from other parts of Micronesia. They had moved to the other islands during the Spanish, German, and Japanese Periods. In 1945, 76 Chamorro were brought from Pohnpei to Saipan. In 1946, 226 Chamorro and 8 Carolinians were brought from Yap to Saipan, and 39 others returned from Palau. In 1948, nearly 600 Chamorro from Yap were brought to Saipan and Tinian, thus repopulating Tinian.

Even with the removal of the large number of Asians and the return of many Chamorro, there was not complete cultural unity in the Northern Marianas. Rota, whose population was mainly Chamorro, except during the Japanese Period, was different from Saipan, whose population since the 1800s had included many Carolinians. Also Tinian, whose Chamorro population had just returned from Yap in 1948, was different from both Rota and Saipan.

From 1947 to 1976, the Northern Mariana Islands were part of the Trust Territory of the Pacific Islands. A series of polls from 1958 to 1969 indicated that a majority of people wanted the Northern Marianas to be reunited with Guam (Farrell, 1991; Rogers, 1995). However, in a special referendum on Guam in 1969, the Guamanians voted against reunification.

The population of the Northern Marianas grew relatively slowly from 1950 to 1980, when the Northern Marianas were under the U.S. Trust Territory governance and foreign investment and economic development were somewhat restricted. In 1980, the population was just 16,780 (Table 8).

Table 8.--Population of the Northern Mariana Islands, 1958-2010.

| Year | Rota | Tinian | Saipan | Northern Islands | Total |
|---|---|---|---|---|---|
| 1958 | 969 | 405 | 6,654 | 262 | 8,290 |
| 1967 | 1,078 | 610 | 9,035 | 263 | 10,986 |
| 1973 | 1,104 | 714 | 12,382 | 133 | 14,333 |
| 1980 | 1,261 | 866 | 14,549 | 104 | 16,780 |
| 1990 | 2,295 | 2,118 | 38,896 | 36 | 43,345 |
| 1995 | 3,509 | 2,631 | 52,698 | 8 | 58,846 |
| 2000 | 3,283 | 3,540 | 62,392 | 6 | 69,221 |
| 2010 | 2,527 | 3,136 | 48,220 | 0 | 53,883 |

In 1975, the voters of the Northern Marianas chose to join the U.S. as a commonwealth (U.S. Government 1975:6), and in 1976 the U.S. Congress passed and the President signed the Covenant to Establish a Commonwealth of the Northern Mariana Islands in Political Union with the United States of America (Covenant) (Public Law 94-241). The Covenant defines the political relationship between the CNMI and the United States, with the CNMI as a self-governing entity under the sovereignty of the U.S. The relationship is governed by the Covenant together with those provisions of the U.S. Constitution, treaties and laws of the U.S. applicable to the CNMI.

The CNMI government adopted its own constitution in 1977, and the constitutional government took office in 1978 when Dr. Carlos S. Camacho became the first governor of the CNMI (U.S. Government, 1978:5). The Covenant was fully implemented on November 3, 1986, pursuant to Presidential Proclamation 5564, which conferred United States citizenship on legally qualified CNMI residents. The people of CNMI are U.S. citizens, but they cannot vote in the U.S. presidential election. In 2008, Congress established a nonvoting CNMI delegate's seat in the U.S. House of Representatives; the first CNMI delegate took office in January 2009.

The CNMI has four municipalities (the Northern Islands, Saipan, Tinian and Rota), each having a mayor, as well as a chiefly structure for their Carolinian communities that influence community life. The village system, with individual mayors elected to each village, is the prevalent local political structure.

**Fishing during the American Period Post-War (1944-1979)**

Soon after the end of hostilities in Saipan, the sunken hulls of the Japanese pole-and-line fishing vessels were raised from the lagoon and reconstructed by Japanese and Okinawan carpenters, prior to the removal of all Japanese nationals early in 1946 (Bowers, 2001:189, 65). American diesel engines replaced the Japanese engines, which made the boats faster and more easily repaired with American parts. Four boats were restored for use in Saipan and Tinian.

A fishing base was established at Garapan, Saipan, and another on Tinian in the embayment north of the harbor (later the site of the Trust Territory Leprosarium shown on the 1983 USGS map). In addition to offshore fishing, a seine crew operated in Saipan lagoon. The fish caught were distributed to the interned civilians. The base on Tinian was abandoned when the island was left uninhabited by the repatriation of the Japanese nationals (Bowers, 2001:189).

After the repatriation of the Japanese, a cooperative of indigenous fishermen was formed on Saipan to engage in commercial fishing. The Saipan Fishing Company was the larger of two indigenous commercial fishing operations in the Trust Territory. The other was in Truk (Bowers, 2001:242). A small group of Carolinian men who were employed as policemen started the Saipan Fishing Company and provided the capital. Shareholders increased to 173 people. Only a half dozen were Chamorro; most were Carolinian (Spoehr, 2000:129).

Post-war production of the commercial fishing industry was greatly reduced from the prewar Japanese production. More than 4000 tons of bonito were harvested in 1937, compared with fewer than 100 tons in 1948 (Table 9). Spoehr (2000:129) reported that by 1950, the Saipan Fishing Company was on the verge of bankruptcy. Only 12 tons of fish had been caught in the first 9 months of 1950, and more than 2 tons had been lost to spoilage.

Table 9.--Prewar and postwar production of the commercial fishing industry, Saipan District (Bowers, 2001:191).

| Marine Products | 1937 (tons) | 1948 (tons) |
|---|---|---|
| Fish | | |
| Bonito | 4075.64 | Species breakdown unavailable |
| Tuna | 97.99 | |
| Mackerel | 15.98 | |
| Mullet | .22 | |
| Shark | 6.39 | |
| Other fish | 168.98 | |
| **Total Fish** | **4365.20** | **89.45** |
| Other Marine Products | | |
| Trepang | 24.34 | 0.00 |
| *Trochus* | 0.00 | 0.00 |
| Turtle | 0.00 | 0.03 |
| Lobster | 0.00 | 0.44 |
| **Total Other Marine Products** | **24.34** | **0.47** |
| **Grand Total** | **4389.54** | **89.92** |

Spoehr (2000:129-130) cited four factors in the demise of the Saipan Fishing Company: (1) the fishermen were more familiar with reef and lagoon fishing than deep-sea fishing for bonito and tuna; (2) maintenance of the fishing boats was a problem; (3) management of the commercial venture was lacking; and (4) there were difficulties in transporting the fish to market in Guam and in marketing the fish there.

Two men, Lino Olopai and Rafael Rangamar, whose fathers were part of the Saipan Fishing Company, were interviewed on Saipan in 2005 (Amesbury and Hunter-Anderson, 2008) (Photo 5). Olopai's father was one of the Carolinian policemen who provided the capital for the fishing company whereas Rangamar's father was captain of one of the boats.

The three boats were identified by their numbers, 1, 6, and 7, with the numbers pronounced in Japanese. Boat 1 was captained by Bwabwa Rabauliman, Boat 6 by Pedro Apolisan, and Boat 7

by Ernesto W. Rangamar, the father of Rafael Rangamar. Ernesto Rangamar became the captain of Boat 7 when Juan Olopai, the uncle of Lino Olopai, retired from that position.

Both Olopai and Rangamar went out on the boats when they were children. Olopai said that his parents sent him out with different boats, and since he was believed to bring luck to the fishermen, they fought over him.

Photo 5.--Lino Olopai (left) and Rafael Rangamar at the Seaman's Restaurant, Saipan, February 2005. Photo Credit: J. Amesbury.

The two men described a day of fishing with the Saipan Fishing Company, which caught mostly skipjack (bonito). Very early in the morning, they set out for Tinian or Aguijan (Goat Island) to catch bait, a small silver-colored fish, known in Japanese as *iriko*. The boats would drop men off in the water while it was still dark, and the men would move toward the cliff concentrating the small fish as they moved, using a fine, long net tied against the wall of the cliff with weights to hold it down. The men on board the boats would pull the net in and scoop the baitfish into the boats, storing them in saltwater containers to hold the live bait.

When a school of fish was spotted, the captain brought the boat up toward the school and slowed the boat down. The fishermen threw a couple handfuls of bait into the water. When the school of fish moved in, the boat was stopped. The boats, which had diesel engines, pumped saltwater and sprayed it out to camouflage the boat and fishermen.

The fishermen used bamboo poles, which they worked on in their spare time. The line they used was from Japan. The hooks had metal heads and no barbs. There was no need to unhook the fish. A fisherman would pull in his pole and flick it or snap it to release the fish. They fished with unbaited hooks. One man would move about the boat throwing bait into the water as the others fished and called out for bait as necessary. Each boat was staffed with 15 men, and they could fill the boat with their catch in 30 minutes. Olopai and Rangamar estimated the catch

consisting of bonito, yellowfin tuna, and wahoo at 60 tons per boat, but Amesbury noted that figure is high compared with data in Bowers (2001:191) and Table 9 (above).

In the heat of the day, from about 10:00 am to 2:00 pm, the fish would stop biting, causing the fishermen to cease pole-and-line fishing operations and engage in bottomfishing or trolling. About 2:30 or 3:00 pm, the fishermen would resume pole-and-line fishing until sunset. The fishermen sold their fish in Saipan, Tinian, Rota, and Guam. It was a long day by the time they had delivered their fish and returned home. The boats came in by the lighthouse. There was a walk-in refrigerator at Garapan, and several of them near Kristo Rai.

Olopai said that sometimes the fishermen played jokes on him. They would fling their fish way back in the boat, then look around surprised and ask what happened to it. Olopai said his uncle would sometimes break into a Carolinian dance to rejoice over the catch or some accomplishment of Olopai's. Both men said they were lucky to grow up in those times because the families were very close back then. When the Saipan Fishing Company ended about 1950, the men who had been involved in the company fished for their own families.

Olopai and Rangamar related how they dried fish. They cut the fish in half and salted and dried it in the sun for a day or two. Then they put the fish into a bucket and covered it with leaves, and put weight on it. When they took it out, they put it on a screen and smoked it. The smoked fish lasted longer than dried fish. They said the fire was always going in a Carolinian outdoor kitchen. Fish that was not dried was eaten raw, as *sashimi*, barbecued or cooked in a soup. When a large amount of food was prepared for a big gathering, the *um* or underground oven was used. The *um* was used to cook a turtle or pig. Sometimes two *um* were used for a big gathering with a separate *um* for breadfruit.

When the Chamorro returned from Yap to Tinian in 1948, there was no employment, so the men were self-employed as farmers and fishermen. Lino Lizama of Tinian said that his father, who was one of the people who moved to Tinian from Yap, obtained a Grumman aluminum canoe from a U.S. military man (Amesbury and Hunter-Anderson, 2008). Lizama still has the canoe (Photo 6). The manufacturer's plate on the canoe indicates that it was the 2,424$^{th}$ canoe built for sale by Grumman, and it is a 17-ft model that was built in 1946 or 1947. Lizama said his father used the throw net and long net for reef fishing and the canoe for bottomfishing, but not in deep water. The canoe was also used to harvest *atulai* (big-eye scad, *Selar crumenophthalmus*) from fish traps made of wire. Lizama called the chamber of the trap *apusento* (Chamorro for bedroom or room) in which the fish were caught. Sometimes moray eels swam into the fish traps and ate the fish. Lizama's father took the *atulai* to Saipan in coolers on Pangelinan's boat. Carmen Dela Cruz Farrell's father fished with Lizama's father. They had a small organization for *atulai* fishing.

Photo 6.--Lino Lizama in his yard in Tinian in March 2005 with a Grumman aluminum canoe built in 1946 or 1947. Photo Credit: J. Amesbury.

As the cash economy grew in the 1960s, people in the CNMI began to buy boats. According to Lino Lizama there were only three or four boats on Tinian by the mid-1960s, and Tony Mesngon said only about four people on Rota owned boats in the 1960s (Amesbury and Hunter-Anderson, 2008). Lizama told how his father acquired the cash to purchase a boat. In the mid-1960s, Lizama's father found a large quantity of machine gun shells made of brass left by the U.S. military. The brass was located at Dumpcoke, northwest coast of Tinian, where the military dumped coke bottles and other things. Lizama's father tied a weapons carrier to a big tree and used the winch on the weapons carrier to raise the drum cans of brass. He sold the brass and used the money to buy a boat and engine. He had five sons who fished with him.

The boat Lizama's father purchased was an 18-foot wooden boat locally built in Saipan by Lizama's father's brother-in-law, Pobio Cabrera. (Pobio Cabrera's wife was a cousin of Lizama's father.) Cabrera worked for Public Works as a carpenter, but he also built and sold boats. The engine was a 40-horsepower Evinrude. The name of the boat was *Bithen de Carmen*.

Estanislao "Stan" Taisacan and Frank Toves, two fishermen on Rota, recalled that electricity was available on Rota by the late 1960s, but it was shut off at 8 pm or midnight (Amesbury and Hunter-Anderson, 2008). It was not until the 1970s that everyone on Rota had 24-hour-a-day

electricity. Toves worked for the government, but he fished for his family, sometimes sold fish, and also dried fish. He had a kerosene-operated refrigerator before electricity was available 24 hours a day.

Carmen Sanchez of Tinian told how she preserved *ti'ao* (juvenile goatfishes, family Mullidae) that her father Justo Lewis Sanchez, a Chamorro born on Yap in 1920, caught with a *talaya* or throw net (Amesbury and Hunter-Anderson, 2008). Carmen used six large pots that were left behind on Tinian by the U.S. Navy to salt and store the fish. When the salt caused liquid to come out of the fish, the liquid was poured off and boiled to kill the bacteria, but the fish were not boiled. The liquid was allowed to cool and poured back over the fish. In this way, the fish could be preserved for a long time. Carmen said it was the more well-to-do families who purchased the first refrigerators.

Stan Taisacan's father, Clemente Saralu Taisacan, was born in Saipan in 1922, but moved to Rota in the late 1920s (Amesbury and Hunter-Anderson, 2008). He was half Chamorro and half Carolinian. Clemente's fishing partner was Tobias Songao Maratita, Stan's mother's stepbrother. Maratita carved a canoe from a seeded breadfruit tree (*Artocarpus mariannensis*), and the men used it for fishing. The canoe was lost during Typhoon Karen in 1962, and after that they used a rowboat built of marine plywood.

Clemente did all kinds of fishing, including fishing for *hachuman* with the *poiu* from about March through June. The fishermen would chew up young coconut of a certain stage of ripeness to use as bait. Using the *poiu* and shortening the line a little each day, they fed the fish in a certain spot every day for about a week. After a week, as soon as the canoe reached the spot, the fish would be splashing around near the surface where they could be easily netted. The fishermen could fill the canoe, which Stan estimated was about 16 feet long, 2 feet wide and 2 feet deep. After netting the fish, the fishermen would have to paddle back with their feet over the sides of the canoe, because the canoe was so full of fish.

Stan helped his father with the *hachuman* fishing, which they did until the late 1960s. He said they sometimes slept on the beach to watch who was going out and to guard their fish (the fish they were feeding). Stan said it would be considered a crime for another fisherman to steal their fish from the water where they had been feeding them. The catch was shared with family members and salted and dried or pickled to preserve it.

Stan's father passed away in 1980, but Stan is now perpetuating the old fishing methods. He and his son have carved two paddling canoes (*galaide* in Chamorro) from *Hernandia* logs (Photo 7). The larger of the two canoes is about 14 feet long. Stan uses the *poiu* for *hachuman* fishing. He still has the *poiu* used by his father, and he has made two replicas using modern tools including a grinder and sander. Stan said that rather than chewing the coconut meat, they sometimes use a food processor, and they use rice as well as coconut.

Photo 7.--Estanislao Taisacan on the beach in Rota in February 2006 with two canoes he and his son carved from *Hernandia* logs. Photo Credit: J. Amesbury.

At the time he was interviewed in 2005, Juan San Nicolas of Saipan was President of the Saipan Fishermen's Association and also the Resident Executive of the Indigenous Affairs Office, CNMI (Amesbury and Hunter-Anderson, 2008). San Nicolas is a Chamorro born in 1947. He learned how to fish from a friend and has been fishing since about 1972. His friend was unemployed, and they wanted to earn some income, so San Nicolas bought the boat, and the friend taught him how to fish. They shared equally the profits they made after expenses.

The boat, which San Nicolas bought from Joeten Enterprises in Saipan, was a 21-foot Bayliner with a 135-horsepower outboard motor. The men caught skipjack (bonito) by trolling and *onaga* (*Etelis coruscans*) and *opakapaka* (*Pristipomoides flavipinnis*) by bottomfishing. They had no Global Positioning System to help them locate their fishing spots. They used landmarks, or if they were caught in a rainstorm, they used a compass.

San Nicolas owned two big refrigerators; as a result, people would come to buy fish from him. He sold skipjack for 35 cents a pound and bottomfish for less. San Nicolas became the first president of the Saipan Fishing Co-op in about 1976. He said the problem with the Co-op was that the fishermen caught more than they could sell. They had agreed not to sell outside the Co-op, but the Co-op couldn't market all the fish. San Nicolas said that at that time there were only two hotels (Royal Taga and Hafa Adai Hotel), and there were few outsiders in Saipan. Saipan was still part of the Trust Territory. The population was small and their buying power was weak. The next president of the Co-op did not succeed in getting the cooperation of the fishermen, as the fishermen kept on fishing, but bypassed the Co-op. As a result, the Co-op ended 2 or 3 years later.

## POPULATION AND ECONOMY SINCE 1980

This chapter begins with the post-Commonwealth boom and then describes the following economic collapse, and the resulting current condition of CNMI's population and economy.

### The Economic Boom of the 1980s

After the Northern Marianas became a Commonwealth, its social and economic conditions changed dramatically. According to the Commonwealth Covenant, only certain sections of the U.S. naturalization and immigration laws applied to the CNMI, which allowed the CNMI to control its own immigration. Under local immigration authority, the CNMI could allow aliens to enter the territory for travel purposes and the local government could issue permits to aliens for work opportunities. Aliens with passports could also travel from the CNMI to the United States, if they had the necessary travel documents.

This allowed the CNMI to bring in low-wage labor from Asia. The Covenant also allowed products made in the CNMI to enter the United States duty free. Both of these provisions encouraged the growth of the garment industry in Saipan. The local government liberalized foreign investment, established a low minimum wage and allowed businesses to utilize foreign "guest workers." This began an era of rapid expansion in the CNMI population as the economy grew. A 2003 Bank of Hawaii-East West Center report described the economic considerations that led to development of the garment industry on Saipan:

> Soon after its legal identity was established, the question was: what would the commonwealth's economy be like once it became an integral part of a vast but geographically distant economy? The nearest U.S. territory, Guam, was not an appropriate example because there was no U.S. military presence in the commonwealth. Control of immigration and labor matters were major advantages, but political autonomy in itself was not a sufficient condition to attract large sums of capital to initiate large-scale industry, whether in services or manufacturing. Another important advantage, although not limited to the commonwealth, was that goods manufactured there could be sold in the United States without import duty and without the requirement that workers be paid U.S. minimum wages.
>
> Together these various advantages enabled the commonwealth to take a totally different route from its neighbors. They could allow Asian manufacturers to set up shop in the islands, hire Asian temporary workers, manufacture garments, and sell them in the U.S. domestic market as if they were produced anywhere else in the country. Similar arrangements were in place in American Samoa, but there a small manufacturing (tuna-canning) labor force from its neighbor, Samoa, was involved. As would be the case with CNMI garments, fish canned in American Samoa factories are sold duty-free in the United States. However, since the labor market and working conditions in the

canneries have not made news in the regional media, American Samoa has not attracted the same kind of attention as has the commonwealth.

> By encouraging Asian garment manufacturers to commence operations on Saipan under the terms and conditions they did, the commonwealth in effect enhanced its comparative economic advantage and its leaders concluded that tourism alone was not the best path to economic prosperity and stability. The belief was that garment making would supplement other economic activities, thus preventing a one industry economy, especially one based on tourism, which would be subject to unpredictable swings in addition to cyclical changes in the regional and global markets (Bank of Hawaii, 2003).

Over the next 15 years, the success of the apparel industry contributed to a dramatic change in the CNMI economy; between 1980 and 1995, the number of jobs in the apparel industry climbed from almost nothing to 7710. The CNMI garment industry produced clothing for global brands such as Tommy Hilfiger, Calvin Klein, Gap, Levi's, Abercrombie and Fitch, Polo Ralph Lauren, Ann Taylor, and Liz Claiborne.

Tourism was joining the garment industry as a major economic driver. The proximity of the CNMI to Japan and other Asian countries combined with its natural tropical beauty made the CNMI a prime location for the establishment of a tourism-based economy during the 1980s and 1990s. From 1980 to 1995, the number of tourists and other travelers to the CNMI increased sevenfold, rising to nearly 700,000 and boosting visitor industry employment to an estimated 9570 (McPhee & Associates and Conway, 2008). From 1988 to 1996, tourism was the Commonwealth's largest income source and most dynamic industry, as well as its main comparative economic advantage (Bank of Hawaii, 2003). Visitor arrivals increased steadily from 1990, reaching a high of 726,690 in 1997 (Fig. 10). The impact of tourism extended beyond airlines, hotels and restaurants; it partly supported the Commonwealth's retail trade, especially in the core urban area that catered more to tourists than to residents, and transportation sectors. When tourist numbers rose, the effect rippled through many segments of the economy (Bank of Hawaii, 2003).

Both the garment and tourist industries contributed directly to the economy by generating employment and bringing revenue from outside the CNMI via exports. In 1995, these two industries accounted for about 80% of all employment. In addition, a 1999 study found that garment manufacturing and tourism accounted for about 85% of CNMI's total economic activity and 96% of its exports.

From 1980 to 1995 CNMI employment levels increased by nearly 13% annually, one of the highest growth rates in the world (McPhee & Associates and Conway, 2008), and another 11,060 jobs were added in nonbasic sectors, including government, during the same period. The expansion of the CNMI economy was made possible by a fourfold increase in population, much of it due to a wave of migrants from Asia looking for work (many of them were employed in the visitor and apparel industries) (McPhee & Associates and Conway, 2008).

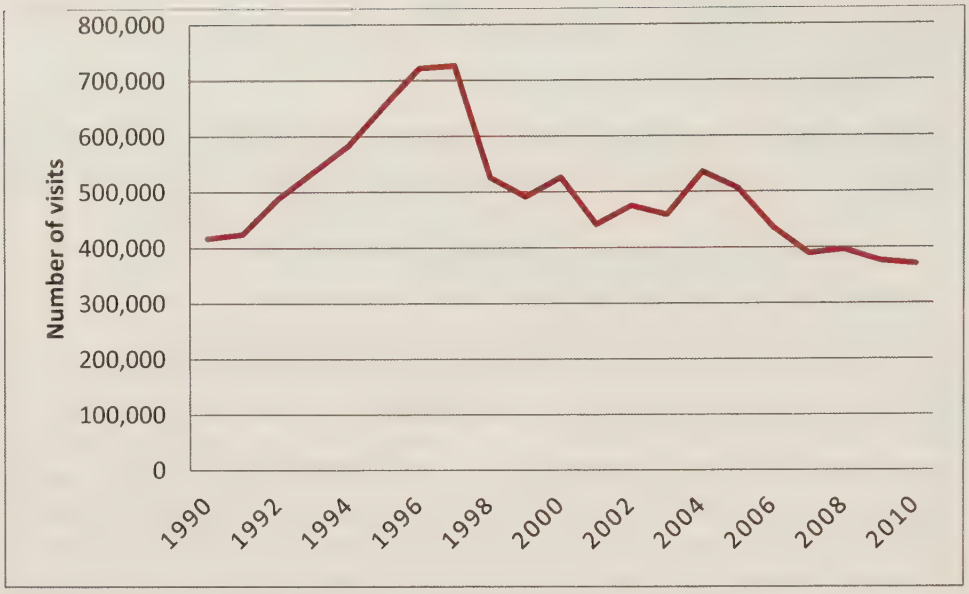

Figure 10.--Trends in visitor arrivals.

The expanding economy increased employment rates (from 31.1 percent in 1980 to 56.4 percent in 1995) and average household income (from $12,859 in 1980 to $29,946 in 1995); the average income of households headed by Chamorro increased even more during this time period, from $11,464 to $39,750 (McPhee & Associates and Conway, 2008).

## The Economic Collapse in the late 90s and 2000s

The garment industry and tourism produced such rapid economic expansion that other sectors of the economy were not expanded, leaving the Commonwealth highly dependent on these two sectors. When they began to decline, there was little to replace them and the effects, which remain today, were devastating.

### Garment Industry

For years, CNMI's garment industry enjoyed favorable treatment under the Multi-Fiber Agreement (also known as the Agreement on Textile and Clothing), which expired in January 2005, thereby opening up U.S. garment markets to manufacturers in developing countries, most notably China. In January 2005, in accordance with World Trade Organization agreements, the United States eliminated quotas on textile and apparel imports from other textile-producing countries. It was just a matter of time when the garment industry in the CNMI would not survive competition from much lower-cost manufacturers. The first garment factory closed its doors in 2000 (McPhee & Associates and Conway, 2008) and the last in 2009.

The seeds of the downturn were sown when China entered the World Trade Organization in 2001 and obtained access to American markets in 2005 (McPhee & Associates and Conway, 2008). Up to that time, CNMI garment factories competed successfully in the U.S. apparel market because of the commonwealth's relatively low minimum wage and access to foreign

labor. But in competition with China's extremely low wage rates, the CNMI could not maintain its advantage. Of the 34 factories operating in 2000, only 3 remained open in September 2008, and the last 3 closed in March 2009 (First Hawaiian Bank, 2010). The value of CNMI textile exports to the United States dropped from $1.1 billion in 1998 to $317 million in 2007 (GAO, 2008), and just $3 million in 2009.

**Tourism Industry**

Tourism's role as an economic driver remains, but its benefits have dropped significantly over the years. In 2003, the Bank of Hawaii noted that tourism's

> Sharp decline in 1997-98 and then in 2001 and only modest recovery since then has shown how fragile and vulnerable that advantage was. The tourism industry is always subject to seasonal ups and down; for example, October to mid-December is considered a 'death valley' period for travel …several factors--Korean Air Lines' decision to suspend flights, the Asian financial crisis, the ongoing economic decline in its principal market, Japan, and the terrorist attacks--combined to stall the commonwealth's once thriving tourist and retail industry…

The Asian economic crisis has had a clear impact on visitor arrivals in the late 1990s. From the peak in 1997, visitor arrivals fell to 491,602 in 1999 but rebounded slightly to 526,111 in 2000. The economic disaster brought by 182,000 in lost airline seats annually as a result of Japan Airlines' pullout from CNMI in October 2005 still lingers. More recently, Japanese tourists cancelled 1800 reservations in CNMI following the March 11 earthquake, tsunami, and resulting nuclear crisis.

As shown in Figure 10 (above), the outlook has not grown brighter (Bank of Hawaii, 2003). During the 2005-2009 period, visitor arrivals declined from 506,846 to 353,956, both reductions from the previous high of approximately 700,000 in the mid-1990s. The decline in visitor arrivals was also evident in hotel occupancy rates, which decreased from 70% in 2005 to 61% in 2009. Hotel room rates per night increased from $83 in 2005 to $95 in 2009, as some hotel businesses attempted to recoup their costs of renovation and all hotels attempted to compensate for the higher costs of operation, including fuel, shipping, food, and labor (First Hawaiian Bank, 2010).

The CNMI's greatest declines in both visitors and flight seats by country were from Japan, which represented the largest share of visitors from any country. The Japanese market share dropped from 71% of the tourist arrivals in 2005 to 50% in 2010, a decrease in Japanese arrivals of 51%, from 376,263 to 182,820 (GAO, 2011a). In 2011, visitors from Japan dropped below 50 percent of CNMI visitor arrivals, an ominous statistic for a tourism industry highly dependent on Japanese visitors.

The tourism economy of the CNMI is closely linked to the economies of Japan, Korea, and China. When the Asian currency crisis unfolded in the late 1990s the CNMI was in a highly vulnerable position. Suddenly, the cost of business operations for Asian companies operating in the CNMI skyrocketed as the U.S. dollar grew stronger against Asian currencies. This also

affected tourists because their currency no longer had the purchasing power to afford them trips to the CNMI. The results were dramatic. A drastic decline in tourism occurred, which resulted in declines in tourism service industries such as hotels and restaurants, retail trade, construction, and other services.

The tourism industry is always volatile, responding to a variety of social and economic forces and events. The industry may try to adapt to conditions, in part, through marketing. The economy affects such efforts, which compounds the problem; in 2010, for example, the Marianas Visitor Authority (MVA) temporarily suspended a number of promotional activities in Japan and Korea in order to pay outstanding liabilities to hotels, tour agencies, and marketing partners.

Another avenue to tourism economic development had been legalized casino gambling and associated development which has not, to date, provided the level of benefits once expected. In 1989, Tinian voters approved the legalization of gambling, with the first casino opening on the island in 1995. This casino is no longer in operation, but the Tinian Dynasty Hotel & Casino opened on April 25, 1998 and is still operating. While up to five licenses are allowed, three proposed casino investments received conditional licenses but have not begun operating.

The Rota Casino Act of 2007 established the Rota Casino Gaming Commission and provided for an unlimited number of licenses for casinos on Rota (although the Commission can cap the number of licenses if necessary for public health, safety, and/or welfare). Saipan voters first rejected the Saipan casino initiative in 2007 and have continued to reject them since then.

## Current Population and Economy

The closing of the garment industry and inconsistency of tourism created effects that rippled through the Commonwealth's society. In 2000, the CNMI had a population of 69,921, 90% on the capital island of Saipan, about 5% each on Tinian and Rota, and a handful of people in the Northern Islands. By 2005, as a result of the faltering economy, the CNMI-wide population dropped to 65,927 and Tinian's population had declined even more rapidly to 2829, just 4% of the total population (CNMI Department of Commerce, Central Statistics Division 2008). Less than half (49%) of the residents of CNMI were U.S. citizens at the time, and the population consisted of 30% Filipinos, 23% Chamorro, 16% Chinese, 5% Carolinians. Asians made up more than half (53%) of the CNMI's total population, Pacific Islanders about 37%, Caucasian less than 2%, while 8% reported multiple ethnicities (CNMI Department of Commerce, Central Statistics Division, 2008). In 2009, the CNMI Department of Labor reported that guest workers accounted for 16,500 (59 percent) of the CNMI workforce of 28,000 persons (Government Accounting Office, 2010).

The population was not prospering economically in 2000, according to a 2003 report from the Bank of Hawaii:

> In 2000, 46.0 percent of CNMI's population lived in households with income below the poverty level, according to the U.S. Bureau of the Census. Allowing that poverty status comparisons may be inappropriate because the CNMI economy is vastly different from the nation's, they do shed light on some of the underlying issues of this unusual labor market. Of the 46.0 percent in households living below poverty level, 10.3 percent were in households of married couples, 7.6 percent in other families with wife or husband absent, and a significant 28.2 percent in households of unrelated individuals. Regardless of the characteristics of these segments of the low income population, that nearly half of the CNMI population existed below the poverty level in 2000 is a phenomenon deserving of more careful and detailed study. (BOH, 2003)

The 2005 CNMI Department of Commerce Household Income and Expenditure Survey counted 2829 residents on Tinian. All of Tinian's population is located in the south with 76% of the island's 2005 population located in and around the main village of San José. The ethnic makeup of Tinian is influenced by the resort/tourism industries that employ guest workers from the Philippines and other Asian countries, with 32% of the population of Tinian of Filipino descent. Just under half of the population of Tinian citizenry was born in CNMI. The great majority of the foreign-born had not become U.S. citizens, and the foreign born population had a higher outward migration rate than did native born residents (Joint Guam Program Office, 2010).

Rota's population peaked at 3509 in 1995, declined to 3283 in 2000, less than Tinian's population at the time, and then dropped to 2490 in 2005, still under Tinian's population (Joint Guam Program Office, 2010). Rota's 2005 population had the highest proportion of Chamorro (65%), compared to 44% for Tinian and 20% for Saipan, and had the highest proportion of U.S. citizens (77%), compared to 55% for Tinian and 49% for Saipan (Joint Guam Program Office, 2010).

Based on data available from the 2010 Census (Table 10), the population of the CNMI decreased by more than 22% from 2000 to 2010 (Table 6). The greatest percent drop was on Rota (23%) while the lowest was on Tinian (11%).[4]

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[4] The U.S. Census Bureau will not publish a full demographic profile until 2013. This profile will consist of a detailed cross tabulation report by places or village level geography, and a report on social, economic and housing characteristics by places or village level geography. (http://gov.mp/2011/01/14/12-22-10-us-census-schedules-data-release-for-cnmi/).

Table 10.--CNMI Population (Source: U.S. Census Bureau).

| | Population | | Change, 2000 to 2010 | |
|---|---|---|---|---|
| | 2000 | 2010 | Number | Percent |
| **Geographic area** | | | | |
| Commonwealth of the Northern Mariana Islands. | **69,221** | **53,883** | **- 15,338** | **-22.2** |
| Northern Islands Municipality | 6 | 0 | - 6 | -100.0 |
| Rota Municipality | 3,283 | 2,527 | - 756 | -23.0 |
| Saipan Municipality | 62,392 | 48,220 | - 14,172 | -22.7 |
| Tinian Municipality | 3,540 | 3,136 | - 404 | -11.4 |

Paralleling the drop in population is continued economic decline, no matter what measures are used. Business Gross Receipts, a measure of the value of sales on CNMI, have decreased over 6% per year since 2005 (First Hawaiian Bank, 2010). Government general expenditures declined almost 7% per year over the same period, while cost of living, as measured by the change in the Consumer Price Index (CPI) for all items sold in the CNMI, increased more than 6% per year between 2002 and 2009. The decreases in real consumer spending in 2008 and 2009 negatively impacted economic growth, most notably in 2009. In 2009, real consumer spending fell by approximately 13% after decreasing by less than 1% in 2008.

In testimony before the U.S. Senate Committee on Energy and Natural Resources, GAO (2007) described results of its 2006 report on CNMI[5]:

> CNMI faces daunting economic, fiscal, and financial accountability challenges. CNMI's economic and fiscal conditions are affected by its economy's general dependence on two key industries. In addition, although progress has been made in improving financial accountability, CNMI continues to have serious internal control and accountability problems that increase its risk of fraud, waste, abuse, and mismanagement.

A GAO report (2007) and accompanying congressional testimony described the declines apparent in the early 2000s:

> The fiscal condition of CNMI's government has steadily weakened from fiscal year 2001 through fiscal year 2005, the most recent year for which audited

[5] U.S. Insular Areas: Economic, Fiscal, and Financial Accountability Challenges (GAO-07-119)

> financial statements for CNMI were available. CNMI's fund balance, which generally reflects the amount of resources available for current government operations, went into a deficit balance during fiscal year 2002 and continued to decline to a deficit balance of $84.1 million by the end of fiscal year 2005. CNMI has also shown significant declines and negative balances in its reported net assets, which is another measure of fiscal health, and which represents the balance of total assets less liabilities. In order to finance its government activities in an environment where expenditures have exceeded revenues, CNMI has increased its debt, causing its debt to asset ratio to increase significantly since fiscal year 2002. In addition, several indicators point to a severe fiscal crisis during fiscal year 2006. The CNMI government has implemented several drastic cost-cutting and restructuring measures, including "austerity holidays" consisting of biweekly furloughs, during which government workers are not paid and many government operations are closed to reduce personnel and operating costs during fiscal years 2006 and 2007. In addition, other measures were passed, including restructuring of payments to the retirement plan and reforming the rate of compensation for boards and commissions (GAO, 2007).

An article in the Saipan Tribune (June 11, 2010) summarized the changes: "From business gross sales to exports, imports and hotel occupancy rate, the CNMI's major economic indicators have dramatically dropped in at least the last five calendar years, mainly due to the death of the garment industry and the steady drop in tourist arrivals." The article cited such dramatic decreases in such indicators as business gross revenues, bank deposits, auto sales, and building permits, some of them dropping to historic lows.

The economy is reflected in the issues facing the CNMI government, including Executive Branch agency furlough days increasing to every Friday and significant problems with the NMI Retirement Fund. As of February 2012, the Fund's investment portfolio (from which it draws pension funds) had an estimated value of $253 million, while its accrued unfunded liability is over $900 million, and the fund is projected to collapse within 3 years (http://pidp.eastwestcenter.org/pireport/2012/April/04-06-06.htm). The 2010 Auditor's report (Pai, 2010) found that in 2009 the CNMI General Fund deficit rose 17.4% from 2008 to 2009, from $256 to $301 million. FY09 reports on financial statements for the public school system and Commonwealth Ports Authority disclosed material weaknesses in internal controls, as well as problems with the Commonwealth Utilities Corporation.

Gross domestic product[6], a measure of the output of goods and services produced by labor and property located in the United States, is another key economic indicator. Gross domestic product (GDP) was not calculated for American Samoa, the CNMI, Guam and the U.S. Virgin Islands until the beginning of 2009. In July, 2011, the Bureau of Economic Analysis released estimates

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[6] The Bureau of Economic Analysis defines gross domestic product (GDP) as the sum of consumer spending (or "personal consumption expenditures"), private investment, net exports (exports less imports) of goods and services, and government spending (or "government consumption expenditures and gross investment"). http://www.bea.gov/scb/pdf/2011/09%20September/0911_territories.pdf.

of GDP for CNMI for 2008 and 2009 and revised the estimates for 2002 to 2007 that had been released the year before. The revised estimates showed a steeper decline over the 2002 to 2007 period (6.3%) than the previously published estimated decline of 4.2%.

The estimated real GDP (GDP adjusted to remove price changes) decreased 19.8% in 2009 after decreasing 12.1% in 2008; this compares to a real GDP for the U.S. (excluding the territories) decrease of 2.6% in 2009 and no change from 2008 to 2009. The estimates of real GDP for 2008 and 2009 reflected continued declines in exports and in consumer spending. The decrease in exports of goods in 2008 and 2009 reflected the continued decline of the CNMI's garment manufacturing industry. Exports of goods fell by more than 60% in 2008 and by over 80% in 2009. Further contributing to the decline in real exports in 2009 was a significant drop in exports of services, reflecting a decrease in the number of visitors to the islands. Despite this decline, tourism services were the territory's only significant export in 2009.

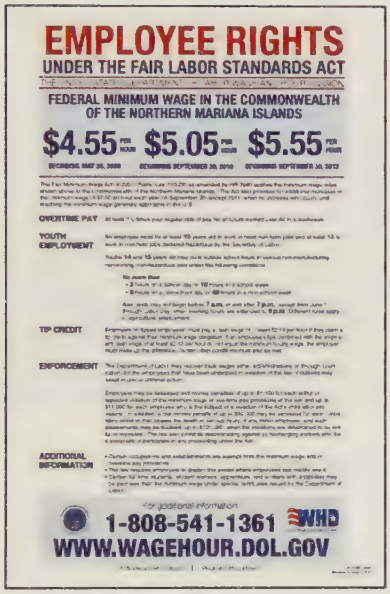
Osman (2004) described one possible comparative advantage for tourism in the CNMI: "A somewhat longer-term prospect for CNMI looks more promising, mainly because of the emergence of China as a regional tourist supplier. ... since CNMI-bound tourists do not need U.S. visas, as they do to enter Guam, CNMI has the advantage to receive Chinese tourists any time once China places the Commonwealth on the list of 'approved destinations' and allows Chinese citizens to travel there." Korean arrivals increased from 65,049 in 2005 to 108,079 in 2010, and the Korean market share increased from 12% to 29% in the same period (GAO, 2011a). The outlook for Russian tourism to Saipan has also improved; in January 2012, a Russian family was welcomed as the 20,000th guest to arrive on Saipan (Marianas Variety Jan. 5; http://www.mvariety.com/special-features/business-edge/42954-20000th-russian-guest-arrives-on-saipan.php). China and Russia still have a combined share of less than 10% of the total tourist arrivals, but they are emerging markets, and Russia accounts for a disproportionate percentage of tourism expenditures (GAO, 2011a).

However, a recent First Hawaiian Bank report on the economies of Guam and CNMI (First Hawaiian Bank, 2010) stated, "economic prospects through 2014 appear to lack promise as well." The report cited one source of business uncertainty as implementation of the Federalization law on November 28, 2009, which applied U.S. immigration law to CNMI, with implications for visa requirements for tourism as well as for foreign workers.

As allowed by Section 503 of the Covenant, Congress passed the Consolidated Natural Resources Act of 2008 (Public Law 110-229), which applied federal immigration laws to the CNMI. The application of federal immigration laws to the CNMI created a situation where aliens legally residing in the CNMI under local laws would be without legal status under federal laws and could face deportation (GAO, 2011a). The Act provided a 2-year transition period, which ended on November 27, 2011, for federal immigration laws to be fully applied. During this 2-year transition, aliens working under CNMI-issued umbrella permits had legal status. In November, 2011, U.S. Citizenship and Immigration Services announced that until December 31, 2012, it would consider granting parole on a case-by-case basis to the immediate relatives of U.S. citizens and certain "stateless" individuals in the CNMI. This announcement came just before the November 27 expiration of umbrella permits held by these nonresidents who may not

have had other options under U.S. immigration law.
http://pidp.eastwestcenter.org/pireport/2011/November/11-25-01.htm

The Guam-CNMI Visa Waiver Program replaced CNMI's former visa program, which had benefitted tourists and foreign investors from China and Russia--countries currently not included in the Guam-CNMI Visa Waiver Program. The report did point out that the parole status to visitors from these nations could be extended on the discretion of the secretary of the U.S. Department of Homeland Security (DHS). Visa requirements for hiring foreign workers are also affected by the Federalization law, which will terminate the CNMI-only "CW" visa after December 31, 2014, unless extended. The change is expected to make it more difficult for foreign workers to get in to the CNMI, affecting all industries including tourism, although how federal agencies implement the law over time could determine the level and magnitude of its economic effects (GAO, 2008).




Another federal action having significant social and economic implications was application of minimum wages to CNMI (and American Samoa). In 2007, the United States enacted PL-110-28, incrementally raising the minimum wages until they equal the U.S. minimum wage. CNMI's minimum wage increased four times before legislation delayed the increases, providing for no increase in 2011 (GAO, 2011b). If further increases are implemented as scheduled, CNMI's minimum wage will reach that of the U.S. in 2016.

Mandated annual studies by the GAO have described effects as the wage increases over time (GAO, 2010; GAO, 2011b; GAO, 2011c). The first minimum-wage increase raised wages for about a third of workers at private sector employers that responded to a GAO questionnaire (GAO, 2010). Wage data from GAO's questionnaire indicated that future increases will affect the wages of more than 80% of those employers' workers by 2015. Small employers and other private sector officials had mixed views of the increases. Many private sector employers said minimum wage increases imposed additional costs during a time in which multiple factors made it difficult to operate, but many expressed greater concern over immigration changes than minimum wage hikes.

In the tourism industry, scheduled minimum wage increases through 2016 would affect 95% of workers employed by questionnaire respondents (GAO, 2011a). Tourism employers reported that they took cost-cutting actions from June 2009 to June 2010 and planned to take additional actions, including laying off workers. Few of these tourism employers attributed past actions largely to the minimum wage increases, and one half or less did so for each of the planned actions. Employers in the tourism industry emphasized that their employment actions were linked to multiple factors, especially the federal immigration law and the declines in the number of tourists. Workers said they favored pay increases to help meet rising prices, but were concerned about losing jobs and work hours. CNMI hotels have generally absorbed minimum wage costs rather than increasing room rates (GAO, 2011b).

## CONTEMPORARY CNMI FISHERIES (1980-PRESENT)

This section first describes the sociocultural importance of fishing and then the small boat fleet, commercial fishing trends, and fisheries governance and institutions. These sections provide a snapshot of CNMI's dependence on and engagement in fishing, the basis of CNMI as a fishing community today.

### Sociocultural Importance of Fishing

The previous sections on the history of fishing describe a long attachment to the sea and marine resources; this tradition continues today.

Saipan residents surveyed in 2005 (Van Beukering et al., 2006) who said they were active and/or commercial fishermen were asked to answer additional questions to better understand the cultural importance of fishing on Saipan and the social and economic role it plays among households and individuals (Van Beukering et al., 2006). About 20% of the sample (79 people) responded to these questions. Of these individuals, 76% had fished more than 10 years. The most frequent type of fishing reported was snorkel spearfishing at night (participated in by 73% of the fishermen) and snorkel spear fishing during daytime (58% of the fishermen), followed by hook-and-line less than 100 ft deep (36%), trolling (21%) cast net (talaya; 14%) hook-and-line more than 100 ft deep (9%), trapping (octopus, crabs, etc.; 19%), foraging the reef (8%); 18% said they participated in one or more other techniques. Less than a third (30%) said they owned a boat.

When asked about motivations for fishing, social and cultural reasons dominated. Nearly a third (32%) said they just really like fishing; 23% said they really need the fish to feed their family; 13% reported that giving catch to family and friends strengthened social bonds; 12% said their family has always fished and fishing is their life; 6% said it strengthens the bond with their children/family; and 4% said they needed the money from the fish they sold. Other reasons included strengthening the bond with their fellow fishermen, fishing to catch fish for fiestas/parties, and seasonal fishing for *manahak*, *ti'ao*, and *i'e* (2% each).

The fishermen reported going fishing an average of 71 days a year, with 26% going once every 2-3 days and 24% fishing once every 2 weeks. The average trip was about a half day (4.4 hours) with 41% fishing between 2 and 4 hours and 30% fishing between 4 and 6 hours. The fishermen reported having decreased their amount of fishing over time, fishing an average of 93 days a year 10 years ago. The most common reason for the change was having less time to go fishing, followed by changing availability of fish, older age, higher costs, and changing family conditions.

The most frequently caught fish were Saipan reef fish (caught by 54% of the fishermen), followed by shallow-water bottomfish (23%) and reef invertebrates such as octopus, shellfish and crabs (14%). The median monthly catch was 40 lbs per person.

Photo 8.--A tale of the land and sea is told on the back of Saipan resident John Castro. Several symbols are included in the large turtle tattoo. At the center of the turtle's back is a latte stone, a symbol of the strength of the Chamorro people. Above the capstone is the rising sun, symbolizing the continuation of life. On either side of the latte pillar are great frigate birds. The frigate birds appear to be the fins of dolphins, which stretch from the top to the bottom along either side of the turtle shell. Between the latte stone and the dolphins are three whale tails representing strength. Below the latte pillar are triangles. The triangles pointing up represent the peaks of islands as seen from the sea, and the triangles pointing down represent shark teeth. Photo Credit: J. Amesbury.

Saipan fishermen reported that 70% of their catch was consumed by themselves and immediate family, with another 20% consumed by extended family and friends. Only 8% of the catch was sold, not surprising given that the fishermen had social and cultural reasons for fishing, rather than economic motivations. The 18 who identified themselves as commercial fishermen reported a median monthly income from fishing of $200 and a mean (average) of just over $1,000; the mean was greater than the median because three fishermen had monthly incomes of more than $3,000.

Noting that the ratio of monthly costs to sales ratio showed that costs exceeded sales for almost every income category of fishermen except those earning over $501 a month and those earning less than $26, the authors suggested that "the bulk of "selling" fishermen are not selling to earn a profit, i.e. that fishing is not a business for them but rather they sell their catch simply to recover some of the costs for their activities" (Van Beukering et al., 2006).

That survey also addressed fish consumption and related characteristics of the Saipan population. Fish remains an important part of the local diet and an integral part of the people's history and culture, but adaptation to and integration with a more westernized lifestyle have changed people's diets on Saipan (Van Beukering et al., 2006). Nearly half (45%) of the survey respondents reported eating "somewhat less fish" than they did 10 years ago. The majority said they ate fish between 1 and 3 times a week (28% said every 2 days, 27% said twice a week, and

23% said once a week). Of the remainder, 4% said they eat fish every day and 18% either once or twice a month.

The majority purchased their fish from a store or restaurant (40%) while 31% purchase fish from roadside vendors. Less common was acquiring fish from an extended relative/friend (13%) or their own catch (11%). The majority of the fish consumed is reported to come from the U.S. mainland (41%), while the next most important source is from inside Saipan's reef (31%), deep water or pelagic fish caught off Saipan (23%), or imported from other Pacific islands such as Chuuk (10%).

Communication among fishermen and from fishermen to the broader community helps to maintain the CNMI fishing community. One outlet is the *Marianas Fishing Magazine*, which is published bimonthly. Both Guam and Saipan addresses and contact numbers are listed in the magazine, which covers events in the CNMI, Guam, and other parts of Micronesia. The second magazine is the *Journal of Micronesian Fishing* (www.micronesianfishing.com) published quarterly by the Pacific Marine Resources Institute, a nonprofit environmental organization based on Saipan.

## Small Boat Fleet

According to Richard Seman, former Secretary of the Department of Land and Natural Resources and former Director of the Division of Fish and Wildlife, more than 400 vessels are registered in the CNMI. More than 200 of the vessels are active and operating in CNMI waters, and more than 100 of the vessels are involved in fishing activities. Fresh fish and fishing have important cultural significance and an active small boat fleet targets tunas, other small pelagics, and bottomfish, although with the increases in the price of gas, pelagic fishing has dropped off somewhat. These fish are marketed locally, given away to family and friends, or used for ceremonial purposes such as parties, culturally significant fiestas, and each village's patron saint's day (National Research Council, 1999).

This rest of this section contains an overview of small boat fleet characteristics, access, and sale of fish on each of the three main islands; these descriptions are taken with permission from a draft report by Impact Assessment Inc. (2011).

Food Fishes of the Mariana Islands
Division of Fish and Wildlife, Department of Lands and Natural Resources, Commonwealth of the Northern Mariana Islands, Saipan MP 96950
Division of Aquatic and Wildlife Resources, Department of Agriculture, 192 Dairy Road, Mangilao Guam 96913
Italic = scientific name; black = English common name; C = Chamorro; J = Japanese; S = South Carolinian; T = Tanapag (N. Carolinian); F = Filipino (Tagalog); P = Palauan; Scale bar = 10 cm (4 in)
Reef Fishes (nets, spear, hook, & line, and traps)

Figure 11.--Diversity of food fishes in the CNMI.

## Saipan

**Small boat fleet.--**As of 2010–2011, fisheries managers estimate the active small boat fleet at approximately 100 vessels. Full-time commercial fishing is primarily conducted by ethnic nonindigenous minorities. Filipino residents, who have recently been displaced from the construction industry with the demise of the tourism boom, fish primarily as independent owners and/or operators. Recent immigrants from the Federated States of Micronesia are primarily employed for wages. Chamorro and Carolinians, in contrast, currently fish for recreational and subsistence purposes, selling catch primarily to recoup costs.

Of the 100 vessels, the majority (60) range from 15 to 22 ft in length and are trailered. Fishing effort is primarily focused within a 20-mile radius on day trips with two fishermen on board. The current vessel size has remained fairly consistent over the past 2 decades and relates to operational costs and local demand for and pricing of catch. As one longtime fishery manager observed, "there is no need for a larger vessel." Handlines, hand reels and electric reels are common for small scale fishing operations.

Of these 60 vessels, approximately 10 are fished by foreigners who serve as employees to boat owners and 10 are fished by residents of Saipan who are employed as independent operators. Fisheries managers report that the creation of an employment system, wherein a fishing vessel is operated by salaried crew or an independent operator, is relatively new, having developed within the last 10 years. Vessel owners typically own two to three vessels and will either pay in cash or as a cut of the catch; the latter reportedly provides motivation to increase catch. Vessel owners provide fuel and gear. Vessels operated by employed fishermen typically fish on a daily basis, as weather permits.

The remaining 40 vessels are owner operated and are fished on a part-time basis, 2 to 3 times a week, often on weekends. Part-time fishermen can be further subdivided into those who are motivated by economic reasons and those who fish more for recreational/subsistence reasons. The former, estimated to be 25 in number, have other part-time/ irregular employment and need additional income whereas the latter, estimated to be 15 in number, are unemployed and/or retired. The two types, however, often overlap in so far as both will sell fish and keep fish to eat; the percentages, however, differ. An estimated five-vessel owner operators are considered "pescadors", a term used to refer to fishermen who provide fish for important community and familial events; especially important are those dedicated to the 10 annual celebrations of patron saints. *Pescadors* will customarily provide 100-200 lbs of reef fish for cooked dishes and pelagic species for *kelaguen* (a raw fish dish) for community and family celebrations.

Of the 100 active vessels in the fleet, approximately 30 range from 23 to 30 feet in length. Of these 30, 10 are full-time commercial fishermen, 10 are part-time commercial fishermen and 10 are part-time recreational and subsistence fishermen. Operators of larger vessels reportedly target primarily pelagic species and occasionally will target bottom or reef fish.

In 2010, a fishery manager estimated only four commercial vessels over 35 feet in length that were active. Larger vessels fish primarily within a 100-mile radius, making trips from 3 to 5 days in length. An estimated 40% of landings is pelagic species and 60% is bottomfish. The vessels are owner operated and carry 3 to 6 member crews; all of whom are residents. The crews

are all full-time fishermen although on occasion the vessels (and crew) will fish for special social and cultural events such as weddings, funerals and fiestas. Increases in fuel prices and low market prices for fish have led to a general decline in boat and trip numbers and landings since 2001 (especially over the past few years), and a high turnover rate for highliner participants (WPRFMC, 2010a ).

Fisheries managers report that the commercial vessels have gradually decreased in size even within the smallest range. In the 1980s and early 1990s boats were reportedly commonly 17-24 feet long; currently, boats are more commonly 14-17 feet long. Smaller size coupled with the use of efficient two-stroke or four-stroke engines have allowed operators to continue profitability in the face of increased fuel prices. The number and avidity of part-time weekend fishermen has also reportedly declined due to increased fuel prices. When fishermen do fish, they reportedly sell more to cover fuel costs.

**Access.**--Sugar Dock and Fishing Base are the most popular launch sites in Saipan for both full-time and part-time fishermen. Sugar Dock lies in close proximity to a majority of the commercial fishing community. It is an area of high use by swimmers, shore net fishermen and tourists undergoing scuba training. Limited roadside parking is available; the dock is currently under repair. A roofed area providing sink and picnicking facilities is located nearby. Fishermen have reported that a lighted channel would be beneficial (Miller, 2001).

Fishing Base is located near fish vendors and the tourist center. It has one launch ramp and ample parking for trucks and trailers. Fifteen trailers were observed during a field visit. There are no other facilities. Smiling Cove Marina is the primary docking area for small vessels in Saipan. It is used by a variety of types of vessels, including: fishing vessels, sailboats, and charter operations. It has floating dock space for more than 60 vessels and is capable of accommodating vessels up to 60 feet in length. There is one launching ramp; launching is reportedly difficult during low tide. It has ample paved parking and a fish weighing station, commonly used during derbies.

The nearby Outer Cove Marina is primarily utilized by large commercial vessels, the ferry, and tourist operations that provide dive boats and tour charters, and does not have a launch ramp.

The Division of Fish and Wildlife ramp is used frequently, while the Tanapag ramp is hardly used as it routinely becomes inundated with sand. Both offer parking (on grass and/or gravel). There are, however, no other facilities and no trailers were observed during field visits. The latter is used by dive operators.

Lau Lau on the eastern side of the island has poor/rough road access. It is used primarily by fishermen with small vessels (12-15 feet) targeting reef fish (by diving) and bottomfish for subsistence purposes. A natural channel permits access beyond the reef, although it is illegal under CNMI law to launch a boat from anywhere but a boat ramp. Pelagic fish reportedly swim very close to the reef on the eastside; weather and sea conditions permitting, small vessel fishermen will also target pelagic species.

**Sale of fish.--**Full-time commercial fishermen sell primarily through or to vendors. In contrast, part-time fishermen prefer to sell to restaurants or to individuals so as to cut out the middleman and receive higher prices. Vendors sell only whole fish and, as such, large pelagic species such as marlin can be difficult to sell. Fishermen reportedly tend to subdivide and distribute large pelagic species among family rather than sell to vendors. Catch from charter operations is reportedly served to guests or kept by operators and crew for home consumption. Fish landed at tournaments is commonly distributed amongst crew to be consumed at home or sold. A portion is also kept for the tournament banquet. Catch is also frequently donated to an elder center.

The CNMI government's volunteer data base collection system records 30 seafood purchasers (including fish markets, general stores, restaurants, hotels and government agencies) operating in Saipan in 2009 (WPRFMC, 2010a). Of these, only 7 roadside vendors and one brick and mortar store were reportedly active when Impact Assessment, Inc. was conducting its fieldwork in 2010. Fisheries managers report that the system of seafood distribution has undergone significant changes in the past decade because of the establishment of large seafood vendors. In contrast to individual fishermen/vendors who only market their own catch, large vendors typically own and operate a number of vessels and purchase catch from independent fishermen to sell. Large vendors offer a wide selection of fish from 10 to 15 coolers, rather than the typical 2 to 3 coolers of the individual fisherman. Currently, competition between vendors is reportedly depressing prices.

Fisheries managers in interviews (Impact Assessment, Inc. 2011) reported that the number of commercial fishermen (full-time or part-time) and seafood purchasers, as well as total commercial landings, have decreased over the long term in response to downturns in the domestic economy. Pelagic participation peaked in the mid-1980s and then grew again in the mid-1990s and dropped again in the early 2000s (WPRFMC, 2010a).

Fish vendors report that demand spikes at the beginning of the month when food stamps are distributed, on paydays (alternating Fridays for government and private sector employees), and Fridays through Sundays. Vendors also report increased demand during Lent; much of the population, regardless of ethnicity, is Catholic and follows traditional Lent practices of giving up meat. Demand also increases when the weather is poor; recreational/subsistence fishermen may not venture out under such conditions.

Currently, the average price per pound to the fishermen is $2.50 for reef fish (although some species of reef fish, such as rabbit fish, fetch a higher price) and $3.00 to $4.00 for bottomfish; pelagic fish prices vary with seasonal and weather related abundance from $0.75 to $2.00.

Photo 9.--A vendor sells fresh fish from a trailer along Beach Road. The sign to the right advertises shrimp, parrotfish, *hangon* (*Naso lituratus*), *sagamelon* (squirrelfishes and soldierfishes, family *Holocentridae*), *mafute* (emperors of the genus *Lethrinus*), and *hiyok* (*Acanthurus lineatus).* The food stamp sign is a common sight at establishments across Saipan. Photo Credit: John Calvo.

**Charter Fishing.**--As of 2010, an estimated three charter boats catered to the tourist industry, conducting half and full day trips. All of the vessels measured greater than 35 feet in length. Declines in tourism and increases in fuel costs have led to a decline in the number and activity of charter vessels. In 1991, there were 27 active charter operations; in 2004, there were 12 active operations (Chapman, 2004). Currently, the three remaining charter vessels are reportedly "barely making it."

**Derby Fishing.**--The first boat-based fishing tournament in Saipan was held in 1985. Currently, two major tournaments are held annually by the Saipan's Fisherman's Association (SFA). The International Fishing Tournament is held in the summer, and the 27$^{th}$ annual tournament took place on July 16 and 17, 2011, attracting 48 boats. The major prize package included a round-trip ticket to anywhere in the United States, a cell-phone, $2,000 in cash, and side bet earnings. An additional $10,000 was available to the boat that broke the previous billfish record. In addition to a chance at winning in the various categories, participants are drawn to the social aspects of the event and banquet that concludes the derby. The derby draws a large crowd of spectators and represents an economic boost to the fishing community.

The SFA Mahi Mahi Derby has been held in the spring for the last 8 years; in 2012, it drew 34 participants and the winning fish was 26 pounds. The Marianas Apnea Spearfishing Club conducts an annual spearfishing tournament, which has been held since 2007. The event is designed to promote the sport, safety, camaraderie, and conservation.

## Tinian

**Small boat fleet**.--Estimates of current fleet size range from 15 to 20 vessels. The majority of vessels is reportedly 12-27 feet in length, with outboards, and are trailered to access points. Consistently throughout the week, an estimated 1-3 fishermen fish with the primary intent of selling fish. Boat-based fishermen target bottomfish (groupers and snappers) by hook and line and pelagic species (yellowfin, mahimahi, wahoo and skipjack) by troll. Respondents suggest that fishing and eating of fish is more habitual, rather than geared toward a particular event. Fishermen frequently sell fish to cover fuel costs. Increasing fuel prices have reportedly led to the decline in number of active fishermen.

Six to seven boats serve tourist clientele, conducting primarily dive trips and, secondarily, charters for trolling, 1 to 2 times a month. Charter boats are reportedly owned by nonlocal residents and target tourists from their country of origin: Japan, China or Korea. Charter trips serve primarily as photo opportunities for clients rather than fishing trips per se, and as such charter boats do not land much catch.

In season, pelagic species run close enough to shore to permit shore hook-and-line fishing. There are an estimated three locations where cliff fishing for mahimahi occurs. Spearfishing is also a common fishing method. Based on the limited lagoon area on Tinian, net casting is not a popular method of fishing.

Tinian has not held a boat fishing derby for an estimated 10 years.

**Access.--**Water access for boats is limited in Tinian as a result of a coastal topography characterized by high cliffs and narrow or nonexistent reef areas. Launch and docking facilities are located on the west side of Tinian. Both are protected by a breakwall. Ample parking is available. The current launching and marina facilities appear sufficient for the current needs of the fleet.

**Fish sales**.--Three restaurants and two stores in Tinian purchase fish. Fishermen will also sell house to house and commonly have an established clientele. The selling price is $2.50 to $3.00 per pound. The selling opportunities are reportedly limited primarily by demand, as local residents either engage in subsistence fishing practices or cannot afford the market price. Three operators of larger vessels (17-20 feet) will occasionally deliver fish for sale to Saipan, when seasonal pelagic species appear in Tinian waters first. The difference in market prices, however, reportedly serves as a deterrent to selling in Saipan.

Previous attempts to support fishing efforts through consignment selling (to Guam) and a fishermen's market have been unsuccessful. The former, although offering a higher market price, was reportedly not received well by fishermen because of their need to recoup operation costs quickly.

## Rota

**Small boat fleet.--**Small fishing vessels range from 14 to 18 feet in length, and are trailered to launch sites. Many are fished primarily on weekends. Two fishermen reportedly fish more

frequently with the intent of selling catch. There is reportedly only one fishing vessel which has a more fuel-efficient four stroke engine.

Currently, 3 to 4 businesses own a total of 6 to 8 boats which serve tourists. They are used for both dive and fishing operations. In addition, one 45-foot boat, which is used primarily to transport construction materials from Guam, is also used occasionally for fishing.

Fishermen target bottomfish (both shallow- and deepwater species), which are available year round, and pelagic species when in season. Fishing grounds for skipjack are reportedly 8 miles offshore and for wahoo and mahimahi 2 miles offshore. Spearfishing, from shore and/or boat, and net casting are also common fishing methods. The number and activity of fishermen have declined as a result of increased fuel prices. Fishermen will only pursue pelagic species "when they are biting;" reportedly word spreads quickly in the close community. Family members also often contribute money to purchase fuel for a fishing trip and make requests for certain kinds of fish.

Rota holds one fishing derby in celebration of the saint of their island, San Francisco. The derby is held in October. When prize money has been generous, up to 40 boats have participated with some coming from Saipan, Tinian and Guam.

**Access**.--Rota has one marina located on the west side of the island. The marina has dock space that can accommodate up to 15 boats. Launch ramps are located on both the west side at the marina and on the east side. Although launching is equally easy on both sides, exiting the channel on the west side is reportedly difficult. As such, launching on the east leeside is reportedly preferred by many. Boats fish for wahoo as they troll out of Sasanhaya Bay along Wedding Cake.

**Fish sales.--**Fishermen sell catch to 3 restaurants that currently serve the community and to neighbors and friends within the community (door to door or from a cooler on the roadside). One general store in downtown Rota sells fish caught by a family member, who fishes specifically to sell. Three restaurants reportedly closed in 2009 because of a lack of business. Based on increased fuel prices, fishermen who need to sell their catch will often check demand with local restaurants. The market price is approximately $3 per pound as a result of current fuel prices. One active fisherman reports the desire to create an export market serving Guam, where he hopes there would be enough demand and a high enough price. The market in Saipan is generally perceived to have too much competition.

### 2011 Survey of CNMI Small Boat Fishermen

Additional information about the CNMI small boat fleet and its characteristics was obtained from a 2011 survey of Marianas Archipelago commercial fishermen (Hospital and Beavers, 2012).[7] NOAA's Pacific Islands Fisheries Science Center conducted the Mariana Archipelago

[7] The results in this section should be considered preliminary because, as of this draft, additional survey forms are being collected, so the sample size will increase. However, the nature of the results and main conclusions are not expected to change. Readers are encouraged to view the full report for additional information.

Cost-Earnings Survey during 2011 to better understand the economic, social, and behavioral characteristics of boat-based fishing in Guam and the Commonwealth of the Northern Mariana Islands. These data are expected to establish important baselines for assessing the economic and social impacts of future management plans, management alternatives and actions. Surveys were completed by fishermen from Saipan, Tinian, and Rota.

A majority (60%) of the 88 fishermen in the sample was Chamorro, followed by 19% Filipino and 12% Carolinian; 13% checked more than one category to describe their race. The largest proportion (43%) was between 35 and 44 years old, while 28% were 45-54 years old and 17% were 25-34. The fishermen reported having fished from a boat for an average of 15 years, and had lived in the Marianas an average of 30 years.

Preliminary analyses support the strong sociocultural role of fishing in the Northern Marianas. The fishermen reported taking an average of 25 fishing trips over the past 12 months; 40% said they took about 1 trip a month, 25% about 2 trips a month, 15% took 1 trip a week, and 15% took 1-2 trips a week. Only a small percentage of fishermen responding to the survey considered themselves to be only part- or full-time commercial fishermen, while the highest proportion described themselves as subsistence fishermen (Fig. 12). More than one-third described themselves as subscribing to more than one of the fisherman categories, emphasizing that CNMI fishermen have multiple reasons for fishing.

Over the past 12 months, the fishermen reported that a higher proportion of their boat fishing trips used trolling as the primary technique, followed by deep bottomfishing (Fig. 12) and reported that the highest proportion of trips took place primarily in both local and federal waters (Fig. 13).

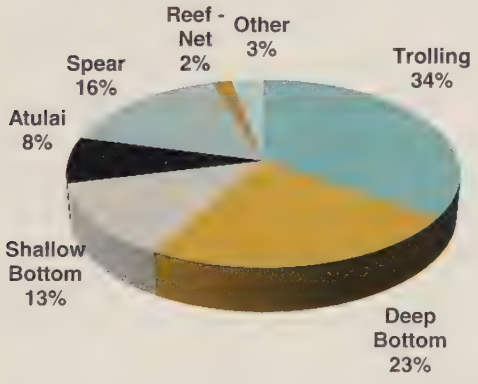



Figure 12.--Fishing trips over the past 12 months.

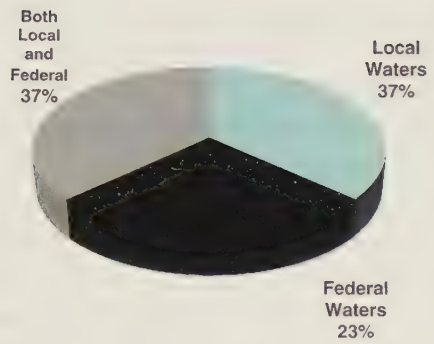



Figure 13.--Location of fishing trips over the past 12 months.

A vast majority of the pelagic fishermen (84%), the bottomfish fishermen (89%), and the reef fishermen (92%) said that the fish they caught were an important source of food for their families. Consistent with that result, a higher proportion of their catch from the last 12 months was consumed at home (29%) or given away to crew, family members or friends and neighbors (33%) than was sold (25%), and an additional proportion (8%) was described as being caught for fiestas or other community and cultural events. Another question asked whether, as a fisherman, they were respected by the community. This reflects the artisanal role of the fisherman as a member of the broader community. Nearly half of the fishermen (47%) agreed that as fishermen, they were respected by the community; just 2% disagreed, while about a third were neutral and 15% said they didn't know.

The survey analysis also identified highliners—the fishermen reporting the largest catches over the past 12 months. This category of fisherman included those reporting catches of 500 lbs or more of pelagics, or 500 lbs or more of bottomfish, or 250 lbs or more of reef fish. Thirty-two of the fishermen (34% of those surveyed) were identified as highliners for subsequent analyses. Of the highliners, 66% were Chamorro compared to 57% of the non-highliners. The highliners also tended to be older, less likely to be employed full- or part-time, more likely to be self-employed or retired, and less likely to have attended college.

The highliners said that 40% of their personal income in the past 12 months had come from fishing, compared to just 18% for the non-highliners. When asked what they did with their fish, it is not surprising that the highliners reported selling a higher proportion of their catch (46%) than did the non-highliners (17%). However, even the highliners, for whom the income from fishing was more important, reported that 19% of their catch was consumed at home, 24% was given away, and 8% was caught for fiestas or other community or cultural events. In addition, a high proportion of the highliners (77-81%) reported that the fish they caught was an important source of food for their families (although these proportions were even higher among the non-highliners).

When asked about trends in fishing, about two-thirds of the fishermen believed that fish had gotten more difficult to catch over the past 5 years; these proportions were about the same whether they were talking about pelagics, bottomfish or reef fish. A higher proportion of the highliners believed that bottomfish and reef fish had been harder to catch, while the proportion was about the same among highliners and non-highliners who had fished primarily for pelagics.

Their reasons for fish becoming harder to catch included increased competition for fish, higher fuel costs, and changes in weather and climate.

When asked whether they believe more people on CNMI will be involved in fishing in the next year, there was overwhelming agreement that more people would be involved in fishing, regardless of the type of fishery the fishermen had participated in or whether or not they were a highliner. Their reasons for believing that more people will be involved in fishing included the poor economy (and hence a greater reliance on fish for food as well as income), the establishment of a fishermen's co-op, and the continued cultural importance of fishing.

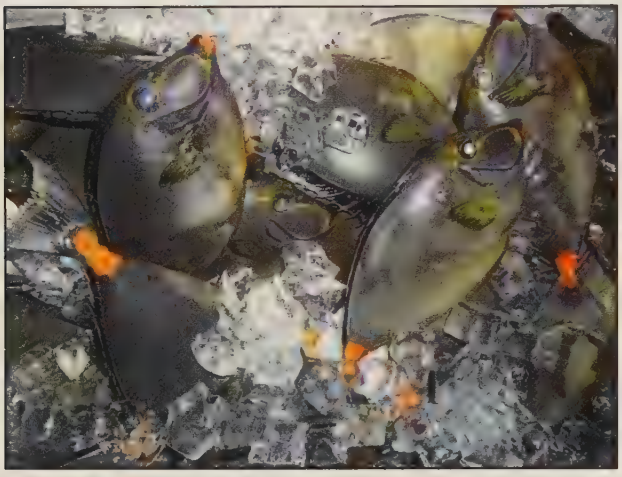


Photo 10.--Orangespine unicornfish (*Naso lituratus*), known as *hangon* in Chamorro, in the ice chest at a fish trailer on Beach Road, Saipan. Photo Credit: John Calvo.

**Saipan Fishermen's Association**

As mentioned earlier in this chapter, the Saipan Fishermen's Association (SFA) is a nonprofit organization that holds fishing derbies annually. When the SFA was established in 1985, it went by the name Saipan Sports Fishermen's Association. That was the name until 2005, when it was decided to remove the word "Sports" and pursue programs that could benefit all local fishermen. When Juan "Money" San Nicolas was President, the group applied for a federal grant to jump-start a fishermen's cooperative. The SFA was awarded grant money from the NOAA Community Demonstration Project Program (CDPP) to help fund the cooperative.

The first fishing derby held by the SFA was in 1985 at Fishing Base in Garapan, across from Kristo Rai Church. SFA has adopted that beach for beach cleanup. The SFA derby is held annually in July or August; derby results and photos available on the web site (www.go2cnmi.com). There is also a mahimahi derby in March or April and a wahoo tournament in November. The 26th Fishing Derby took place July 17-18, 2010. The tournament attracted 66 boats and more than 200 fishermen from Saipan, Tinian, Rota, Guam, Japan, and the Philippines. In addition to organizing the fishing tournaments, the SFA also participates in community involvement projects, such as beach cleanup.

Usually there is also an annual derby (by invitation only) that targets emperors, such as *mafuti* and *lililok* (*Lethrinus* spp.). Boats may not be more than 15 feet long, and the fish must be at

least 8 inches long. Fishermen enter their biggest fish by weight and the total weight of their next five fish. This derby takes place from 4 to 9 pm. Each boat pays $25 to enter, which is used to purchase ice and water. Everyone brings half a case (12 cans) of their favorite beverage and leaves it on the dock. The weighing is done by 9:30 pm, and the banquet takes place the same night.

In September 2010, Gene Weaver, current SFA president, reported about 20 active members of the SFA.[8] There are no dues for membership; the "dues" consist of coming to meetings and participating. SFA receives money for prizes by selling ads in the tournament booklets. SFA has corporate sponsors including the petroleum companies, Shell and Mobil, and communications companies, IT&E and Docomo Pacific. Another sponsor of the annual tournament is Micronesian Marine, a boat manufacturing company in Saipan run by Roland Johnson.

## Commercial Fishery Statistics

There are currently no requirements for commercial fishing vessel, operator, or crew licenses for inshore or offshore waters of CNMI. All data collection efforts are on a voluntary basis. Since the mid-1970s, the CNMI Division of Fish and Wildlife (DFW) has been collecting data on fishing in Saipan. DFW later expanded its fisheries monitoring programs to include Rota and Tinian. DFW distributes and collects invoice books from participating fish purchasers on Saipan. These records encompass approximately 90% of all commercial fishing. The Western Pacific Fisheries Information Network (WPacFIN) compiles and expands the data to represent the entire CNMI. The data from 1983 and later are considered the most accurate.

DFW's principal method of collecting domestic commercial fisheries data is a dealer invoicing system, sometimes referred to as a trip ticket system. The DFW provides numbered two-part invoices to all purchasers of fresh fishery products (including hotels, restaurants, stores, fish markets, and roadside vendors). Dealers then complete an invoice each time they purchase fish directly from fishers; one copy goes to DFW and one copy goes to their records.

Information collected includes: date; weight (pounds); buyer's name (dealer); price per pound; seller's name (fisherman); species; and invoice number. These data are collected for all purchases of fishery products; however, species identification is frequently made only to a group level, especially for reef fish.

Some advantages of this data collection method are that it is relatively inexpensive to implement and maintain and it is a fairly easy way to inventory the entire commercial fishery. DFW can also provide feedback to dealers and fishers to ensure data accuracy and continued cooperation. There are some disadvantages: (1) dependency on non-DFW personnel to identify the catch and record the data; (2) restrictions on the types of data that can be collected; (3) required education and cooperation of all fish purchasers; and (4) limited recordings of fish actually sold to dealers. Therefore, a potentially important portion of the total landings is unrecorded. Since 1982, DFW

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[8] G. Weaver, pers. commun., conversation with Judith Amesbury, September 2010.

has tried to minimize these disadvantages in several ways: (1) maintaining a close working relationship with dealers; (2) adding new dealers to their list and educate them; and (3) implementing a creel survey to help estimate total catch, including recreational and subsistence catch.

The current system collects data from dealers in Saipan, where DFW estimates more than 90% of all CNMI commercial landings occur. The DFW also estimates that the proportion of total commercial landings that have been recorded in the Saipan database since 1983 is about 90%. In 2011, fisheries managers noted concerns regarding incomplete participation (by vendors); incomplete listing of species (especially of bottomfish and reef species) on fish tickets; incorrect identification of species; and incomplete coverage of the Northern Mariana Islands. In regards to the lattermost point, data collection efforts in CNMI are confined to Saipan; landings and revenue are inflated by 30% to represent CNMI as a whole. Data collection efforts for Rota reportedly stopped in 2009. DFW staff on Tinian report that the lack of data collecting is a result of understaffing; in addition, the database does not include information on catch that is kept for noncommercial use (Impact Assessment Inc., 2011).

Figure 14 shows estimated commercial landings in the CNMI from 1981 through 2009 (http://www.pifsc.noaa.gov/wpacfin/cnmi/Pages/cnmi_data_1.php), while Figure 15 displays the dollar value of these catches. Pelagics have constituted the largest proportion of the catch in most years, especially since 2002. The proportion of reef fish in overall catch has declined, while bottomfish catch has remained stable. The catch numbers reflect the 2002 ban on the use of spearfishing with scuba and 2003 restrictions on the use of gill, drag, and surround nets.

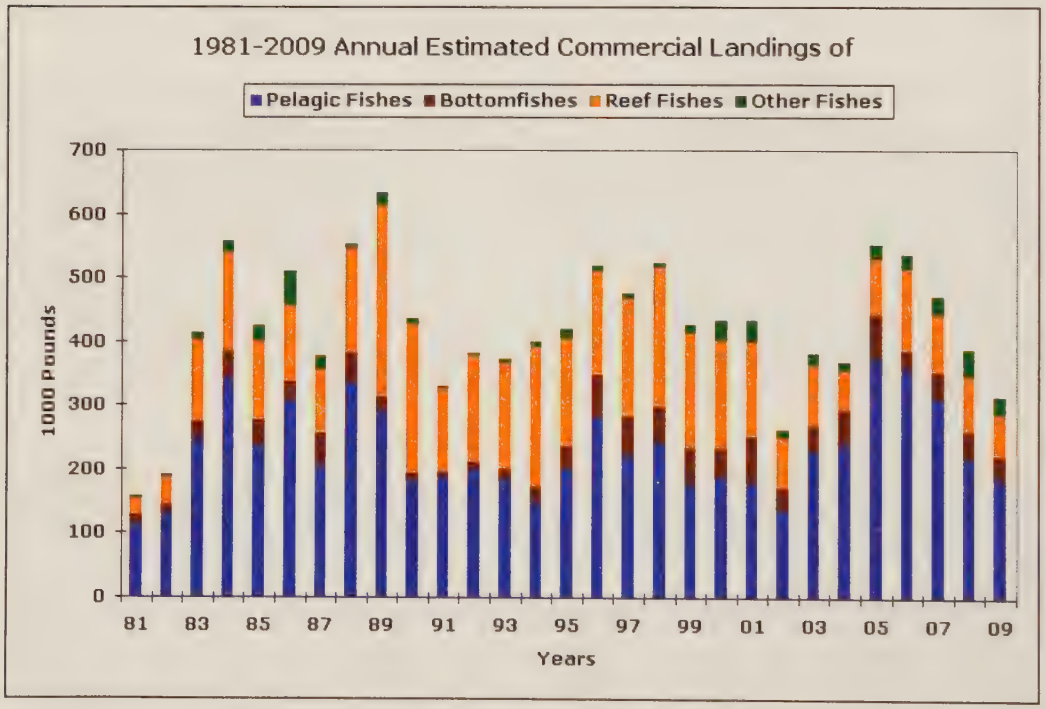


Figure 14.--Annual estimated commercial landings in the CNMI of pelagic fishes, bottomfishes, reef fishes, and other fishes by 1000 pounds (http://www.pifsc.noaa.gov/wpacfin/cnmi/Pages/cnmi_data_1.php).

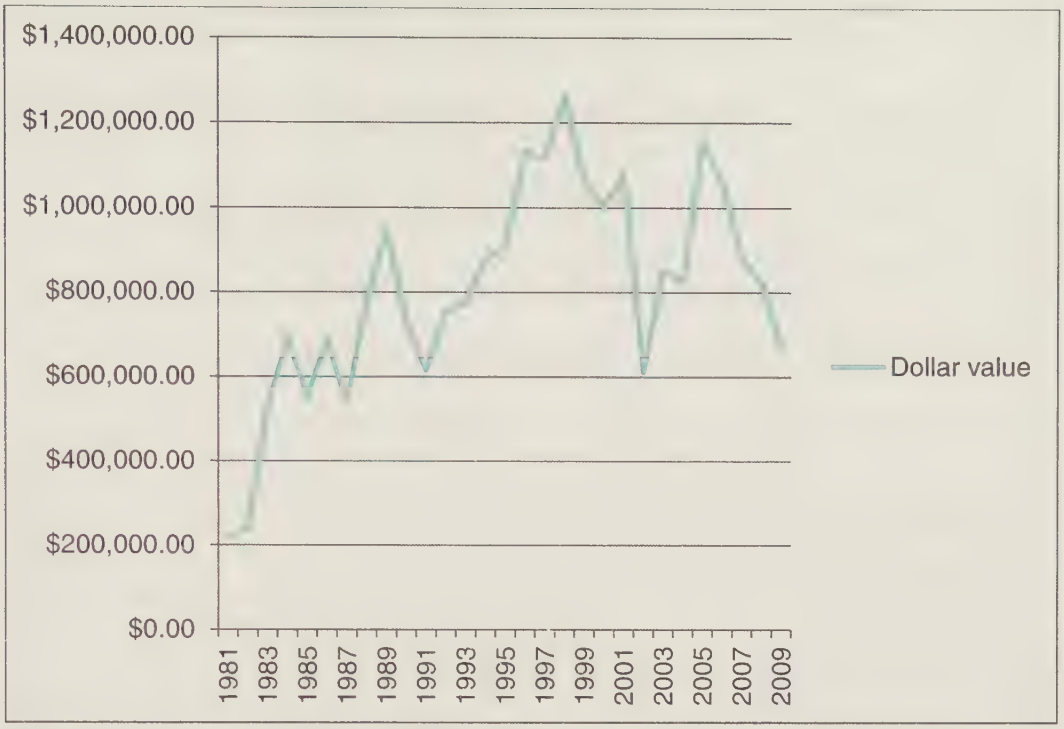

Figure 15.--Nominal Value of CNMI Commercial Fish Catch 1981–2009 (http://www.pifsc.noaa.gov/wpacfin/cnmi/Pages/cnmi_data_1.php).

Table 11 provides additional detail for 2009 commercial landings, showing that skipjack tuna provided the largest share of both pounds and value, despite having one of the lowest prices per pound among commercial fish (http://www.pifsc.noaa.gov/wpacfin/cnmi/Pages/cnmi_data_1.php). From 1983 to 2009, skipjack constituted an overall average of 77% of the catch, followed by yellowfin tuna (10%), mahimahi (9%), ono (3%), and blue marlin (1%) (WPRFMC, 2010a). The composition of the CNMI pelagic catch is very different from that of Guam's pelagic catch. In the CNMI, the average annual commercial catch of skipjack exceeds 170,000 pounds, but yellowfin, mahimahi, wahoo, and marlin average less than 22,000 pounds each. On Guam, the average annual total catches of mahimahi and skipjack exceed 170,000 pounds each, and 55,000 to 87,000 pounds of wahoo, yellowfin, and marlin (WPRFMC, 2010b). It is possible that the preference for skipjack in the CNMI is a result of Saipan's history with the prewar Japanese and postwar Carolinian pole-and-line fishery for skipjack.

Table 11.--Annual estimated commercial landings in the CNMI for 2009 (http://www.pifsc.noaa.gov/wpacfin/cnmi/Pages/cnmi_data_1.php).

| Species | Pounds | Value ($) | Price/Per Pound ($) |
|---|---|---|---|
| Bigeye scad | 25,052 | 62,584 | 2.50 |
| Jacks | 2,092 | 5,132 | 2.45 |
| Black jack | 112 | 280 | 2.51 |
| Giant trevally | 55 | 136 | 2.50 |
| Bottomfishes (unknown) | 4,487 | 11,296 | 2.52 |
| Sickle pomfret | 511 | 1,201 | 2.35 |

| Species | Pounds | Value ($) | Price/Per Pound ($) |
|---|---|---|---|
| Ehu (red snapper) | 2,572 | 9,263 | 3.60 |
| Gindai (flower snapper) | 2,393 | 8,698 | 3.63 |
| Groupers | 768 | 2,240 | 2.92 |
| Kalikali (yellowtail) | 2,393 | 5,894 | 2.46 |
| Onaga (red snapper) | 3,517 | 15,008 | 4.27 |
| Opakapaka (pink snapper) | 3,898 | 10,569 | 2.71 |
| Jobfish (uku) | 1,701 | 3,550 | 2.09 |
| Silvermouth (deep lehi) | 1,042 | 2,945 | 2.83 |
| Amberjack | 326 | 868 | 2.66 |
| Blue lined snapper | 1,126 | 2,790 | 2.48 |
| Reef fishes (unknown) | 34,807 | 88,800 | 2.55 |
| Wrasses | 365 | 873 | 2.39 |
| Rabbitfishes | 1,288 | 3,806 | 2.95 |
| Emperors | 11,386 | 28,577 | 2.51 |
| Squirrelfishes | 215 | 536 | 2.50 |
| Parrotfishes | 23,911 | 74,276 | 3.11 |
| Surgeonfishes | 2,113 | 4,589 | 2.17 |
| Orangespine unicornfish | 313 | 782 | 2.50 |
| Unicornfishes | 1,296 | 3,333 | 2.57 |
| Goatfishes | 830 | 2,077 | 2.50 |
| Bigeye emperor | 48 | 120 | 2.50 |
| Pelagic fishes (unknown) | 125 | 251 | 2.00 |
| Barracudas | 24 | 35 | 1.50 |
| Mahimahi | 19,580 | 34,980 | 1.79 |
| Blue marlin | 47 | 71 | 1.50 |
| Sailfish | 162 | 243 | 1.50 |
| Rainbow runner | 1,759 | 3,476 | 1.98 |
| Wahoo | 3,389 | 6,777 | 2.00 |
| Skipjack tuna | 129,176 | 209,875 | 1.62 |
| Dogtooth tuna | 2,575 | 4,233 | 1.64 |
| Yellowfin tuna | 25,113 | 49,435 | 1.97 |
| Kawakawa (saba) | 1,521 | 2,311 | 1.52 |
| Spiny lobster | 881 | 4,385 | 4.98 |
| Slipper lobster | 165 | 827 | 5.00 |
| Octopus | 438 | 903 | 2.06 |
| Squid | 8 | 16 | 2.00 |
| TOTAL | 313,581 | 668,042 | 2.13 |

### Longlining in the CNMI

In 2008, a longline fishing company began operating out of Saipan. USA Islands Seafood Inc. (USAISI) was purchased by private investors in May 2008. The firm's mission was

> to produce, process and market quality fish and processed fish products at competitive prices in the local market and to establish itself as the leading seafood exporter in the region. The company aims to maintain an environmentally friendly and sustainable fishery to assist in protecting and preserving the fishery reserves of the CNMI. (www.USAIslandsSeafood.com).

The USAISI fishing fleet in Saipan was made up of 4 vessels, the 70-ft F/V *Jenny* (which appeared in the movie The Perfect Storm), the 80-ft F/V *Pacifica*, the 85-ft F/V *Miss Saipan*, and the 100-ft F/V *Lady Carolina*. Its website lists 12 species of fish that they caught: 4 species of tuna (albacore, bigeye, yellowfin, and skipjack); 4 species of billfish (blue marlin, striped marlin, shortbill spearfish, and broadbill swordfish); and 4 other species (mahimahi, wahoo, opah, and monchong). According to one of the owners, Dave Lewis, they also caught and marketed about 10 sharks a month (threshers, makos, white tips, blue sharks, and even the shallower black tips). However, USAISI has shut down operations and does not fish anymore in the CNMI. The company is considering moving operations to the FSM or to Hawaii.[9]

## FISHERIES GOVERNANCE AND INSTITUTIONS

This chapter describes how fisheries and marine resources are managed in the CNMI, and by whom. These include both federal government and CNMI government agencies, as well as local groups.

### Federal Government

As of this writing, CNMI still does not have authority over territorial waters, which continues to be a highly sensitive political issue. As previous sections suggested, other actions such as the increase in minimum wages, the federal management of immigration, and designation of the Marianas Trench Marine National Monument, along with other events, have contributed to commonwealth-federal government tensions.

In the mid-1970s, the United States (Public Law 93-435) conveyed to certain territories, including Guam, American Samoa, and the Virgin Islands, their submerged lands extending out to three geographical miles from the coastline. At that time, CNMI did not belong to the United States. After the Northern Mariana Islands became a commonwealth, CNMI sued the United

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[9] M. Trianni, pers. commun. (review of draft of this document), April 18, 2012.

States for ownership of the entire 200-mile EEZ. That claim was not supported, so the entire 200-mile EEZ falls under the authority of the federal government.

In 2009, a bill (HR 934), sponsored by CNMI Delegate Gregorio Sablan and which passed the U.S. House of Representatives, would have amended PL 93-435 to convey the submerged lands out to 3 miles to the CNMI. Subsequent legislation in the House and Senate would have accomplished this same goal but, to date, the conveyance has not occurred. Recently the CNMI Legislature passed a Resolution requesting that the federal government give back the entire 200-mile EEZ or pay the CNMI $67 billion. CNMI has always been granted 0-3 mile management authority by NMFS.[10]

## Division of Fish and Wildlife

The Division of Fish & Wildlife (DFW) is one of several agencies under the CNMI government's Department of Lands and Natural Resources. The Division was created in 1981 by Public Law Number 2-51, the "Fish, Game and Endangered Species Act". As described on the DFW website, the DFW mission is to conserve fish, game and wildlife, and to protect endangered and threatened species: "Through research, monitoring, regulation, enforcement, planning and management, the Division seeks to ensure the long-term survival and sustainability of the CNMI's natural resources for present and future generations."

DFW consists of a Wildlife Section, Fisheries Section, Planning and Education Section, Enforcement Section and Administrative Section. Activities include species-specific research, population and habitat monitoring, adaptive management, educational programs at schools, outreach at public events, environmental planning, and permitting for major developments, and enforcement activities. DFW has deployed 11 fish aggregating devices (FADs) for recreational fishing. DFW develops and enforces regulations for hunting, fishing, harvesting, and taking of species, as well as human behavior and activities in protected and conservation areas in the CNMI. For example, there is currently a local moratorium on harvesting trochus and sea cucumber in the CNMI. DFW also reviews development proposals submitted to the Coastal Resources Management Office (CRMO) and/or Division of Environmental Quality (DEQ).

Within the Fisheries Section, the Fisheries Research Program is charged with protecting endangered, threatened, and scarce species; restoring and conserving marine habitat; and sustaining fisheries stocks for multiple uses. As described above, the Fisheries Data Program works with WPacFIN to provide data for fisheries management purposes, including data obtained via a boat-based offshore creel survey, data on fish imports, and commercial purchase data.

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[10] See footnote #9.

Managaha Marine Conservation Area
A Fully Protected No-take Area
CNMI's Marine Protected Areas
ROTECTING OUR REEFS AND FISH SO THEY CAN BE ENJOYED TODAY AND TOMORROW
Call: 664-6030 or 888-5906

Photo 12.--Sign on Mañagaha Island informing the public of the Conservation Area. Photo Credit: J. Amesbury.

DFW also administers CNMI's marine protected areas with varying levels of restricted activities. No-take reserves prohibit the fishing or harvesting of any marine species of plant or animal, prohibit take of coral (live or dead), and prohibit all exploitive or destructive activities to marine life. In Saipan, there are three no-take reserves:

- Managaha Marine Conservation Area
- Forbidden Island Marine Sanctuary
- Bird Island Marine Sanctuary

The Mañagaha Marine Conservation Area covers 500 hectares around Mañagaha Island within Tanapag Lagoon and the adjacent reef slope on the west side of Saipan. Violations of the Mañagaha Marine Conservation Area are considered civil violations and violators are subject to administrative hearings. Violations of the Forbidden Island and Bird Island Marine Sanctuaries are criminal violations and violators are subject to court hearings.[11]

The island of Rota has the Sasanhaya Fish Reserve, which is a no-take zone for all marine species; created in 1994, it was the first marine protected area in the CNMI. The island of Tinian has CNMI's newest marine reserve, established in 2007, extending from the Southwest Carolinas

[11] R. Seman, pers. commun., December 2010.

Point to Puntan Diablo and now extends to the end of the harbor. The reserve is primarily a no-take reserve for 5 years from the date it was established, but seasonal fish, such as *atulai* (big-eye scad, *Selar crumenophthalmus*), *i'e* (juvenile jacks, such as *Caranx melampygus*), and *ti'ao* (juvenile goatfishes, family *Mullidae*) may be harvested during their respective seasons. The law calls for an assessment after 3 years to determine whether certain other activities may be permitted.

Photo 13.--Poster showing Sasanhaya Bay Fish Reserve boundaries and regulations.

Maps showing the boundaries of the reserves, as well as the management plans of each, are available on the DFW website Wildlife (www.dfw.gov.mp). In addition, the Lighthouse Reef Trochus Sanctuary was designated in 1982 and the Lau Lau Bay Sea Cucumber Sanctuary was designated in 2008.

Other fisheries conservation actions are taken directly by the CNMI government. Public Law No. 15-124 (January 3, 2008) was the first law that banned shark fins:

> It shall be unlawful for any person within the Commonwealth or any place subject to the jurisdiction thereof, to take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or in any manner, any SHARK, alive or dead, or any part thereof, without being permitted to do so as provided in this section…may be assessed a civil penalty by the (DFW) Director of not more than $5,000 for each such violation…

Photo 14.--Mañagaha Island. Photo Credit: J. Amesbury.

**CNMI Coral Reef Initiative Program**

NOAA's Coral Reef Information System website provides the following description of CNMI's coral reef systems:

> Saipan has the most diverse types of coral reefs and associated habitats in the CNMI. A fringing and barrier reef system protects the majority of the beaches along the western and coastal plains. The western side of the island is the most populated and the coral reefs along these areas are negatively affected by human activity. Continuing sediment and nutrient pollution, combined with sporadic stressors such as outbreaks of crown-of-thorns starfish (COTS) and bleaching, affect many of Saipan's western and southeastern reefs.
>
> Coral reef ecosystems in the CNMI are, on the whole, reasonably healthy. However, environmental stressors acting synergistically with anthropogenic stressors, such as nonpoint source pollution and fishing pressure, have clearly affected areas in proximity to the populated southern islands. From a fisheries perspective, the northern islands and more distant banks and reefs appear to be in better condition than those closer to population centers. http://coris.noaa.gov/portals/cnmi.html#1)

The CNMI Coral Reef Initiative Program was established by Executive Directive 235 in 1997 in conjunction with the first International Year of the Coral Reef. The Program is supported by funding through the U.S. Coral Reef Initiative Management and Monitoring Grant programs. The Program, which is under the Office of the Governor, uses an interagency structure to coordinate coral reef issues. The agencies include the Coastal Resources Management Office, the Division of Fish and Wildlife, and the Division of Environmental Quality. The interagency group is tasked with protecting coral reefs and implementing Local Action Strategies (LAS) projects (http://www.cnmicoralreef.net/). The Program monitors nearshore and reef flat areas on all three main islands and issues a number of reports available on its web site. The Program

produces a variety of educational and outreach materials and activities, and sponsors a summer internship program allowing several college or college-bound students the opportunity to work in coral reef conservation projects.

Since 2003, CNMI's CRI has used LAS to identify management priorities based on a suite of NOAA-designated priority threat categories. To date, CNMI has addressed Non-Point Source Pollution, Fisheries and Coral Reef Management, Recreational Use and Public Awareness with LAS activities. They are now reviewing and revising LAS to align with revised NOAA priorities to address threats of Overfishing, Non-Point Source Pollution, and Climate Change. The Program also makes sure that LAS actions complement local priorities for achieving the goals of the Micronesia Challenge.[12]

The LAS web site (http://www.cnmicoralreef.net/) contains more information on activities being conducted to conserve CNMI's coral reef ecosystems.

### Coastal Resources Management (CRM) Program

The Coastal Resources Management (CRM) Program, which implements the Coastal Zone Management Act (CZMA) of 1972, was established by the Commonwealth government in 1980 to promote the conservation and wise development of coastal resources. The coastal zone includes all nonfederal lands on the island, as well as offshore islands and nonfederal submerged lands within 3 nm.

The Coastal Resources Management Office has identified Areas of Particular Concern (APC), geographic delineated areas having special management requirements. Before work begins on any project located wholly or partially within an APC, a valid coastal permit is required. This is not applicable to federal-lease lands or federally owned submerged lands, but the CZMA consistency determination addresses potential impacts on these APCs. Currently, there are five APCs in CNMI:

1. Shoreline – The area between the mean high water mark and 150 ft (46 m) inland;
2. Lagoon and Reef – The area extending seaward from the mean high water mark to the outer slope of the reef;
3. Wetlands and Mangrove – Those areas that are permanently or periodically covered with water and where species of wetland or mangrove vegetation can be found;
4. Port and Industrial – Those land and water areas surrounding the commercial ports of Saipan, Tinian, and Rota; and

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[12] The Micronesia Challenge is a commitment by the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, Guam, and the Commonwealth of the Northern Marianas Islands "to preserve the natural resources that are crucial to the survival of Pacific traditions, cultures and livelihoods." The overall goal of the Challenge is to effectively conserve at least 30% of the nearshore marine resources and 20% of the terrestrial resources across Micronesia by 2020.

5. Coastal Hazards – Those areas identified as coastal flood hazard zones in the Federal Emergency Management Agency Flood Insurance Rate Maps.

By statute, the CRM is mandated to balance the potentially conflicting management goals of both allowing use of and preserving CNMI natural resources.

This task is difficult as a result of the large amount of geographic and descriptive information that must be considered in any management decision, so the program has been using Geographic Information Systems (GIS) technology to improve resource management and project permitting decisions. The CRM participates in the NOAA Coastal Services Center (CSC) multiyear Pacific region initiative, designed to build capacity of Pacific coastal zone management agencies.

## Western Pacific Regional Fishery Management Council

The Western Pacific Regional Fishery Management Council (Council) is 1 of 8 regional fishery management councils established by the Magnuson Fishery Conservation and Management Act of 1976. The Council has 13 voting members and 3 nonvoting members. A chair and four vice chairs (one from each island area--Hawaii, American Samoa, Guam, and CNMI) are elected annually by the Council members. Management measures created by the Council and approved by the Secretary are implemented by the National Marine Fisheries Service (NMFS). The Council's Mariana Archipelago Fishery Ecosystem Plan (WPRFMC 2009b) describes management of the CNMI and Guam. This place-based, adaptive management structure is designed to increase collaboration with domestic and international management bodies, government and nongovernmental organizations, communities and the public to develop federal fishery management policies.

According to Richard Seman, the CNMI had only observer status in the Council until 1995,[13] when CNMI became a full voting member after the CNMI Governor and the U.S. Department of the Interior agreed to disagree on the CNMIs' claim to the 200-mile submerged lands. The CNMI stated that by becoming a member of the Council, it was not relinquishing its claim to the 200-mile EEZ, and the U.S. also stated that by including the CNMI on the Council, the United States was not giving up its claim to the 200 miles. However, the Council has always delegated management authority for 0 to 3 miles to the local CNMI natural resource agencies.

In addition to representation on the Council, CNMI has members on the Council's Scientific and Statistical Committee, Plan Teams, Advisory Panels, Fisheries Data Coordinating Committee, Technical Committee, Marine Protected Area Advisory Committee, Non-Commercial Advisory Committee, Social Science Research Committee, and Marianas Archipelago Regional Ecosystem Advisory Committee.

The Regional Ecosystem Advisory Committee (REAC) meetings serve as a forum for local agencies and the public to voice their interests and concerns to the Council about fishing and other marine ecosystem issues. Recent topics discussed at the REAC meetings have included

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[13] R. Seman, pers. commun., December 2010.

indigenous cultures' interests in obtaining exemptions from the Endangered Species Act to enable them to practice their culture by a small take of listed green sea turtles, and presentation of Coral Reef LAS accomplishments related to the priority areas including fisheries, land-based sources of pollution, recreational overuse, education and outreach and coral bleaching and disease, such as educating the community on the effects of wildfire burn-offs and land erosion on reefs.

The Council has recently taken actions to reduce competition between larger vessels and the small, local vessels of the CNMI (and Guam and American Samoa). At its 141st meeting in 2008, it recommended prohibiting purse seining in the EEZ around Guam and CNMI and excluding longline vessels from fishing within 30 nautical miles from shore around the CNMI. The longline exclusion zone was subsequently approved by NMFS, but the purse seine exclusion zone was not. The Council also set a control date for the developing CNMI-based longline fishery.

The Council's Western Pacific Community Demonstration Project has in the past provided grant support to CNMI to establish a fishing outpost in the Northern Islands. One objective of the proposal was to assess the feasibility of reestablishing a population in the Northern Islands. The Northern Islands of the Commonwealth are largely uninhabited, but (as noted earlier in this report) some have hosted very small resident communities. These islands are difficult to supply and lack harbors and airfields.

The Council recently (2011) developed recommendations for annual catch limits for all managed species in the Western Pacific region, including the Marianas Archipelago. These limits were required by the 2006 reauthorizations of the Magnuson-Stevens Act. It appears that these will not be limiting factors to fishing in the CNMI, although the impact will need to be monitored because it is such a new regulation.

## Marianas Trench Marine National Monument

President George W. Bush established the Marianas Trench Marine National Monument on January 6, 2009. President Bush exercised the authority vested in him by Section 2 of the Antiquities Act, which authorizes the President to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on lands owned or controlled by the U.S. Government to be national monuments.

The Monument includes the waters and submerged lands out to 50 nautical miles of the three northernmost Mariana Islands, Uracas, Maug, and Asuncion (Islands Unit), the submerged lands out to 1 nautical mile of designated volcanic sites (Volcanic Unit), and the Marianas Trench from the northern limit of the EEZ around the CNMI to the southern limit of the EEZ around Guam (Trench Unit). These areas make up approximately 95,216 square miles of submerged lands and waters of the Marianas Archipelago.

According to Presidential Proclamation 8335, the Secretaries of Commerce and the Interior will manage the Monument. The Secretary of Commerce has primary management responsibility

with regard to fishery-related activities. The Secretary of the Interior may permit scientific exploration and research within the Monument, and the Secretary of Commerce may permit fishing within the Monument for scientific exploration and research purposes. The proclamation specified that the Secretary of Commerce prohibit commercial fishing within the Islands Unit, but provided the potential for sustenance, recreational, and traditional indigenous fishing to be managed as a sustainable activity. Prohibitions required by the Monument proclamation did not apply to activities and exercises of the U.S. Armed Forces.

The Secretaries of the Interior and Commerce were directed to prepare management plans to provide for, among other things, traditional access by indigenous persons, as identified by the Secretaries in consultation with the Government of the CNMI, for culturally significant subsistence, cultural and religious uses within the Monument. The proclamation also called for the establishment of an Advisory Council, consisting of three officials of the Government of the CNMI and one representative each from the Department of Defense and the U.S. Coast Guard.

An initial original proposal for the Monument developed by the Pew Foundation and President Bush's subsequent proclamation have led to social conflict within the CNMI. The organization Friends of the Monument was developed to support the idea of Monument designation, while other individuals catalyzed opposition. Governor Benigno R. Fitial wrote a letter to President Bush in April 2008 opposing new protections around the northernmost islands and the adjacent trench, saying, "We rely on fishing as a source of food and jobs...Those who live in the CNMI have no interest in ceding their cultural heritage to the federal government under the auspices of environmental protectionism." However, the Saipan Chamber of Commerce supported the idea (with caveats), saying that designating a Marianas Trench Marine National Monument would enhance tourism during financially struggling times.

When the Monument was designated, however, Governor Fitial issued a statement of support (Saipan Tribune, 2009):

> I welcome President Bush's historic announcement establishing the Marianas Trench Marine National Monument...All of us in the Commonwealth of the Northern Mariana Islands appreciate this recognition of our unique natural and geological environment. We anticipate that this designation will encourage and support scientific and educational programs that will enlighten people all over the world regarding the Mariana Trench, hydrothermal vents, and coral reefs now protected as parts of the Monument.

Fitial then explained the reasons behind his support:

> Over the past few months, I have been actively engaged in discussions with the White House Council on Environmental Quality regarding the objectives and scope of the proposed monument. I have been joined in these discussions by President Pete Reyes of the Commonwealth Senate and Speaker Arnold Palacios of the Commonwealth House of Representatives. Our objectives in these conservations were very simple: to put aside the very divisive advocacy of the PEW Foundation on this subject and to focus on the need to protect the

interests of the people of the Commonwealth…I believe that the end result is an example of how federal and local officials can work together productively to achieve a common objective.

First, the Monument designation focuses on the area necessary for the proper care and management of these unique resources-which ranks it high among the nation's largest conservation areas…

Second, the designation prohibits commercial fishing only within the large area surrounding the three northern islands included in the Monument which are already protected by the CNMI Constitution.

Third, the designation defers to the local Commonwealth government to determine what traditional indigenous fishing should take place within this protected area.

Fourth, the designation does not conflict with areas where potential mineral deposits are most likely to be found.

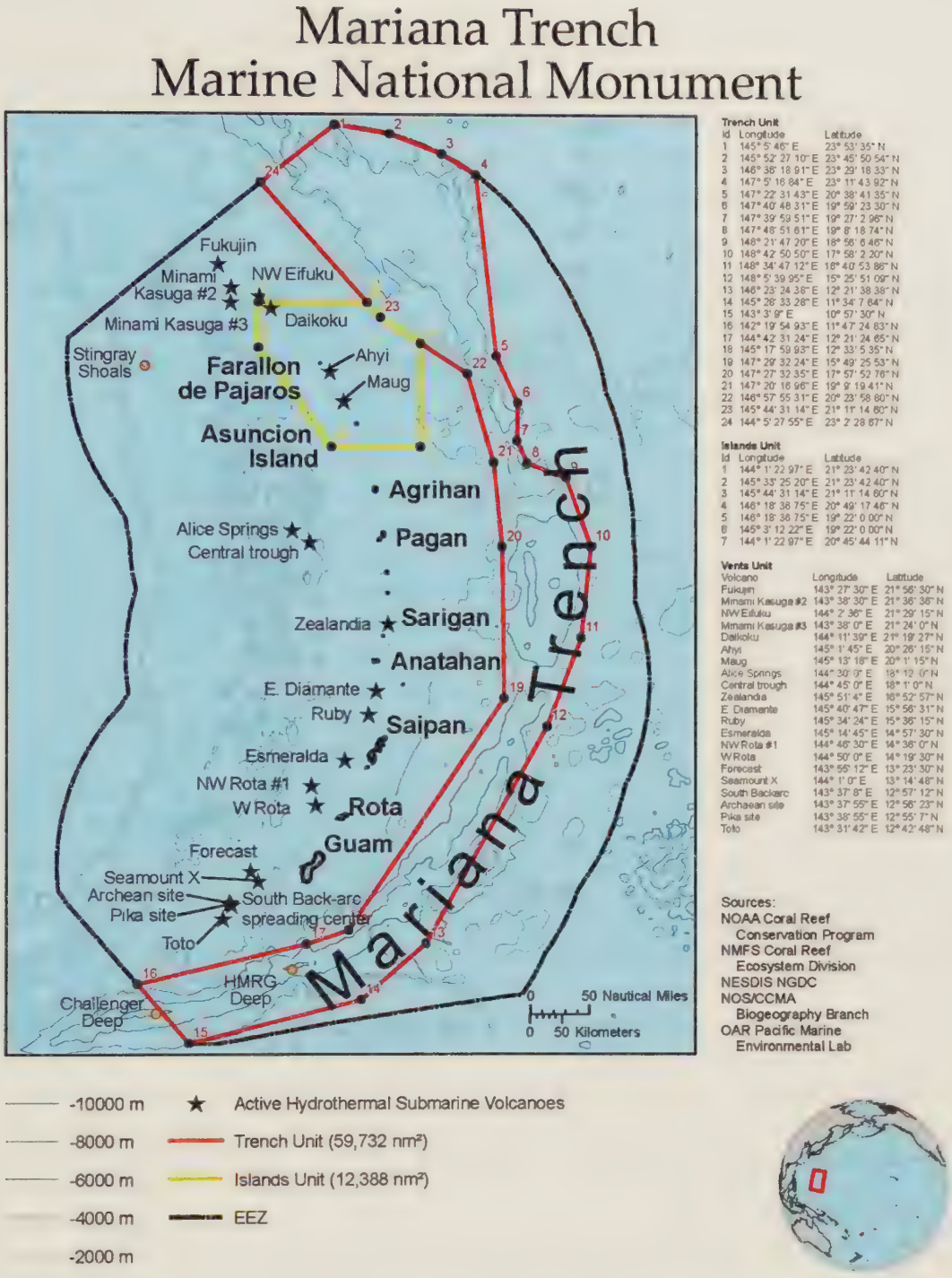
Fifth, the Administration has committed to support legislation giving the Commonwealth control over its submerged lands and to develop legislation providing economically beneficial access to mineral deposits on federal submerged lands.

Finally, the Monument Proclamation provides for full participation by the Commonwealth in the comanagement of the monument.

The U.S. Fish and Wildlife Service (representing the Secretary of the Interior) and the NMFS Pacific Islands Regional Office (representing the Secretary of Commerce) are currently developing a management plan for the Monument, and the NMFS Pacific Islands Fisheries Science Center (PIFSC) is currently coordinating a marine ecosystem science plan for research within the Monument. The Council is developing regulations for defining and managing the types of noncommercial fishing that the proclamation provides for in Islands Unit waters. Those regulations will be forwarded to the Department of Commerce. The PIFSC Human Dimensions Research Program is currently studying Guam and CNMI residents' awareness of the Monument, their preferences for management and scientific research, and their related attitudes. The Program also is studying traditional fishing activities in the Islands Unit.

## ISSUES AFFECTING CNMI AS A FISHING COMMUNITY

This section contains a number of key factors that can be monitored to assess how CNMI is changing as a fishing community.




**Trench Unit**

| Id | Longitude | Latitude |
|---|---|---|
| 1 | 145° 5' 46" E | 23° 53' 35" N |
| 2 | 145° 52' 27.10" E | 23° 45' 50.54" N |
| 3 | 146° 38' 18.91" E | 23° 29' 18.33" N |
| 4 | 147° 5' 16.84" E | 23° 11' 43.92" N |
| 5 | 147° 22' 31.43" E | 20° 38' 41.35" N |
| 6 | 147° 40' 48.31" E | 19° 59' 23.30" N |
| 7 | 147° 39' 59.51" E | 19° 27' 2.96" N |
| 8 | 147° 48' 51.61" E | 19° 8' 18.74" N |
| 9 | 146° 21' 47.20" E | 18° 56' 6.46" N |
| 10 | 148° 4' 2.50.50" E | 17° 58' 2.20" N |
| 11 | 148° 34' 47.12" E | 16° 40' 53.86" N |
| 12 | 148° 5' 39.95" E | 15° 25' 51.09" N |
| 13 | 146° 23' 24.36" E | 12° 21' 38.38" N |
| 14 | 145° 28' 33.28" E | 11° 34' 7.64" N |
| 15 | 143° 3' 9" E | 10° 57' 30" N |
| 16 | 142° 19' 54.93" E | 11° 47' 24.83" N |
| 17 | 144° 4' 2' 31.24" E | 12° 21' 24.65" N |
| 18 | 145° 17' 59.93" E | 12° 33' 5.35" N |
| 19 | 147° 29' 32.24" E | 15° 49' 25.53" N |
| 20 | 147° 27' 32.35" E | 17° 57' 52.76" N |
| 21 | 147° 20' 16.96" E | 19° 9' 19.41" N |
| 22 | 146° 57' 55.31" E | 20° 23' 58.80" N |
| 23 | 145° 44' 31.14" E | 21° 11' 14.80" N |
| 24 | 144° 5' 27.55" E | 23° 2' 28.67" N |

**Islands Unit**

| Id | Longitude | Latitude |
|---|---|---|
| 1 | 144° 1' 22.97" E | 21° 23' 42.40" N |
| 2 | 145° 33' 25.20" E | 21° 23' 42.40" N |
| 3 | 145° 44' 31.14" E | 21° 11' 14.80" N |
| 4 | 146° 18' 38.75" E | 20° 49' 17.46" N |
| 5 | 146° 18' 38.75" E | 19° 22' 0.00" N |
| 6 | 145° 3' 12.22" E | 19° 22' 0.00" N |
| 7 | 144° 1' 22.97" E | 20° 45' 44.11" N |

**Vents Unit**

| Volcano | Longitude | Latitude |
|---|---|---|
| Fukujin | 143° 27' 30" E | 21° 56' 30" N |
| Minami Kasuga #2 | 143° 38' 30" E | 21° 36' 36" N |
| NW Eifuku | 144° 2' 36" E | 21° 29' 15" N |
| Minami Kasuga #3 | 143° 38' 0" E | 21° 24' 0" N |
| Daikoku | 144° 11' 39" E | 21° 19' 27" N |
| Ahyi | 145° 1' 45" E | 20° 26' 15" N |
| Maug | 145° 13' 18" E | 20° 1' 15" N |
| Alice Springs | 144° 30' 0" E | 18° 12' 0" N |
| Central trough | 144° 45' 0" E | 18° 1' 0" N |
| Zealandia | 145° 51' 4" E | 16° 52' 57" N |
| E. Diamante | 145° 40' 47" E | 15° 56' 31" N |
| Ruby | 145° 34' 24" E | 15° 36' 15" N |
| Esmeralda | 145° 14' 45" E | 14° 57' 30" N |
| NW Rota #1 | 144° 46' 30" E | 14° 36' 0" N |
| W Rota | 144° 50' 0" E | 14° 19' 30" N |
| Forecast | 143° 55' 12" E | 13° 23' 30" N |
| Seamount X | 144° 1' 0" E | 13° 14' 48" N |
| South Backarc | 143° 37' 8" E | 12° 57' 12" N |
| Archaean site | 143° 37' 55" E | 12° 56' 23" N |
| Pika site | 143° 38' 55" E | 12° 55' 7" N |
| Toto | 143° 31' 42" E | 12° 42' 48" N |

Figure 16.--Map showing boundaries of the Marianas Trench Marine National Monument.

## The Declining Economy

It is impossible to separate discussions about the trends in CNMI as a fishing community from discussions about the overall health and condition of CNMI, which is dominated by the near collapse of the CNMI economy. A recent economic update (First Hawaiian Bank, 2010) concluded that,

> The economic outlook nowadays for Saipan and the other islands of the Commonwealth of the Northern Marianas (CNMI) is bleaker, and it may not get any better soon. Both of the main traditional sectors have sustained major blows in recent years. Clearly, the CNMI must find some new economic growth engine. The two main pillars of the Saipan economy have been tourism, mainly from Japan, and the garment industry. But Japanese tourism has nosedived, and the garment industry has moved on to cheaper locations.

A report prepared for the 2007 Business Opportunities Conference sponsored by the U.S. Department of the Interior, Office of Insular Affairs (Shin, 2007) also contained a number of ideas for revitalizing the CNMI economy, including: tourism (and related businesses); education; island products (agriculture, aquaculture, spring water on Rota); infrastructure (renewable energy, transshipping service, sewage system); the film industry (production and post-production); and opportunities associated with the military buildup in Guam.

Many other ideas are being discussed, some of which involve fishing as an economic development mechanism (see following section). Results of a survey of CNMI fishermen (Hospital and Beavers, 2012) suggest that current fishermen believe more people will be fishing on CNMI in the future—commercially as a way to supplement income, and for subsistence to supplement diet and assist the community. Fishing rates could also decrease because of rising fuel costs that inhibit people's inability to participate. There is also concern about immigrants, especially people living in poverty, and their effect of fish and reef resources. Regardless, it will be important to track economic conditions and the corresponding adaptive behavior and implications for fishing and fish populations.

Impact Assessment, Inc. (2011) reported that the economy was affecting fishing activities, with fishing levels and market prices being affected by government pay cuts and furloughs and an ongoing decline in the tourism industry in CNMI. The impact of pay cuts and furloughs was perceived as encouraging people to look at other ways to earn and save money, including fishing for home consumption and sales, but high fuel prices were serving as an impediment to fishing.

## Federal Regulations and Involvement

U.S. Public Law 110-229 re-federalized the CNMI immigration policy and control. Areas of uncertainty include guest worker labor availability and the continued ability of Chinese and Russians to invest in second homes or other real estate (Joint Guam Program Office, 2010). Resorts are particularly at risk because of their dependence on foreign workers who may be repatriated, and because tourists from the People's Republic of China and Russia, comprising

about 20% of tourism revenues, may no longer qualify for visa waivers under the new rules. Another significant piece of legislation is U.S. Public Law 110-28, which increased the CNMI minimum wage incrementally to meet the U.S. federal minimum wage, potentially resulting in an increase in unemployment. Other federal issues include the ongoing dispute over control of waters out to 3 miles and the designation of the Marianas Trench Marine Monument is another federal action. Although the Monument could be an economic asset to CNMI, its creation was viewed by some as yet another federal encroachment on the CNMI's local sovereignty. The use of CNMI lands, waters, and air space by the U.S. military is also a social issue and source of conflict.

At the same time, federal funds flowing into CNMI contribute substantially to the economy. A recent Saipan Tribune article (2011a) described a new commitment of $1 million to aid economic development efforts through job training.

The military buildup taking place on Guam also could affect CNMI, although not at the same scope or scale. The Final EIS on the project (Joint Guam Program Office, 2010) described the proposed action in CNMI as consisting primarily of development at Tinian of live-fire training ranges and airspace use. No Marine Corps relocation and/or training activities are planned for the marine environment on Tinian, nor are in-water construction, dredging, or training activities, or land-based construction activities that would directly impact the marine environment (Joint Guam Program Office, 2010). Construction of facilities for training and operations on Tinian are expected to be conducted by contractors based on Saipan or Guam and to create a maximum of 180 construction jobs per year, for a 2-year period, and about 35 indirect jobs in the Tinian economy. However, Tinian ranchers would be "significantly impacted by the termination of grazing leases located within the range footprints and associated Surface Danger Zone (SDZs)." Depending on the alternative, the acreage of land with agricultural/grazing permits that would be affected by the proposed action would be between 5 and 15% of the total amount of agricultural/grazing land available in the lease back area (Joint Guam Program Office, 2010).

Many of the implications of these federal actions have not yet transpired, so it will be important to monitor not just the status of these federal laws and actions, but how the CNMI community responds to them and, in turn, how fishing is affected.

### Saipan Fishermen's Cooperative Association

Fishing cooperatives (co-ops) serve many functions both to the fishing community and to the broader community. The development of a new co-op on Saipan could accomplish many goals and strengthen both the industry and the broader community. If the co-op can find an energetic manager and succeed like the Guam Fishermen's Co-op, the Saipan co-op could greatly enhance fishermen's access to stores, restaurants, and other markets for fish.

Impact Assessment, Inc. (2011) reported that fishermen in Saipan, Tinian, and Rota noted challenges arising primarily from low market prices and lack of local demand. A cooperative could provide the facilities and proper handling standards to process fish and, as such, may provide fishermen with an outlet for larger pelagic fish. Currently, vendors only sell whole fish

and such prefer smaller pelagics that can fit into coolers. In addition, fishermen and managers alike note that a cooperative structure might support the more casual or weekend fishermen by assuring purchase of catch at an established price. Fishermen in Rota and Tinian noted a lack of local demand to support consistent sale of catch. Cold storage, processing, and transport facilities were reportedly required and desired to support the creation an export market. Infrastructure challenges in CNMI primarily relate to boat ramp access.

Miller (2001) suggested several actions that could be taken to improve the operations of the small boat fleet, including a Commonwealth rebate of the liquid fuels tax for commercial fishing vessels, fisherman education and training on fish quality and handling and possible gear alternatives, and market development. The report noted that development of a successful fishermen's coop could contribute substantially toward these and related efforts.

## Fishing as Economic Development

The fishing industry, including local fishermen and the import market, is linked to tourism. A study by the Department of Commerce Central Statistics Division found that fish imports dropped by close to 85% in a 6-year period, from 1.194 million pounds in 1992 to only about 184,300 pounds in 1997. The report said this trend indicated that an increasing number of local businessmen ventured into commercial fishing, spurred by the increasing demand by the islands' hotels and restaurant for fresh sea products (Saipan Tribune, 2001). Of the 380,135 pounds of fish caught and sold in the Northern Marianas in 1997, reef fish constituted the largest species group, followed by skipjack tuna and mahimahi. However, imports still comprised more than half of total fish sold in the Northern Marianas each year.

Fisheries also are recognized as an economic development mechanism; the same report (Saipan Tribune, 2001) also mentioned that "A study previously commissioned by the Commonwealth Ports Authority has, in fact, recognized the bright potential for fish transshipment in the Northern Marianas ... A domineering program that may be implemented by the CNMI government on fish transshipment can handle at least 150 boat loads of 15-20 tons per month, bringing at least $3,500 in wharfage revenue to the seaport each month. Also, there are some opportunities to transship fresh or frozen tuna in the CNMI, taking advantage of the airlift to Japanese market."

The developing longlining industry participants have ambitious marketing plans. Some people don't think they will succeed, but if they do, that would be almost a new industry for the CNMI. There hasn't been any significant successful commercial fishing in the CNMI since the Japanese fishery in the 1920s and 1930s. Pelagic fish in the western and central Pacific Ocean, including the Marianas Archipelago, are subject to regulation by a regional fisheries management organization, the Western and Central Pacific Fisheries Commission, of which the United States is a member. Although bigeye tuna are not a strong target species for CNMI longliners, the WCPFC has established quite a large limit, 2000 metric tons (or an unlimited amount, if the entity has a responsible fisheries development plan), for jurisdictions which do not currently have an established bigeye fishery, including CNMI. This at least suggests that international regulations would not be a limiting factor in longline expansion, and that this generous limit could perhaps be used as an economic advantage through a leasing mechanism with other fleets.

In the early 2000s, the Northern Marianas College developed an economic assessment of the domestic fisheries development potential of the Commonwealth of the Northern Mariana Islands (Miller, 2001) This report was funded by an Saltonstall-Kennedy grant to the CNMI Department of Commerce. The report stated that, "locally based pelagic fisheries in the Commonwealth of the Northern Mariana Islands have not developed to fully use the 200-mile EEZ, nor have they achieved harvest levels of formerly operating foreign fleets." The report concluded that

> Development of larger-scale domestic pelagic fisheries in the CNMI does not appear to be likely at this time. The primary constraints on such development are that the infrastructure that is available in the CNMI is not oriented toward commercial fishing and it is not cost competitive with the Port of Guam. Further, locally based pelagic vessels must compete with imported fish landed in large volumes in Guam. Any locally based transshipment operation would also have to be competitive with Guam operations. Large-scale fish processing development is also not seen as a potential for development due to potential conflicts with the tourism sector, environmental concerns, and the fact that such operations are currently struggling in the region. In light of the limited potential for development of larger-scale pelagic fisheries, it seems prudent that the CNMI government should focus its efforts on promoting the existing small boat pelagic fleet. Vessels operating in the existing pelagic fleet are generally profitable at this time. Increased activity, participation, and harvests in that fishery do not appear to be constrained by regulations, finance, infrastructure, or labor. The primary constraint on the local small boat pelagic fishery is its limited local market. The limited local market has likely been negatively affected by a decline in the local economy. Significant import competition also limits that market and will likely continue to do so.

Impact Assessment, Inc. (2011) reported that the fishermen interviewed had mentioned infrastructure and fisheries closed areas as issues. Two of the most heavily used boat ramps are difficult to operate during low tide; a previous infrastructure issue was the need for a light channel at the most heavily used ramp at Sugar Dock (Miller, 2001). The number and maintenance of FADS was also discussed. CNMI already has marine reserves and is a participant in Micronesia Challenge. Additional spatial closures would likely affect shore and nearshore users, rather than offshore fishermen. The closures could, however, indirectly impact boat-based fishing activity by displacement of effort and/or increased market demand for fish. Tracking many of these fishing concerns and issues will necessarily involve tracking the capacity and actions of fisheries management institutions, whether or not the issue is economic development.

## Trends in Fishing Patterns

As mentioned above in the Economy section, the current economic decline could affect fishing in many ways. It will be important to continue to monitor levels and types of shoreline and boat-based fishing in the CNMI, and the blend of commercial/noncommercial activity. This is especially important given the recent development of annual catch limits (ACLs) for all managed

species by the Council, as mandated by the recent reauthorization of the Magnuson-Stevens Act. ACLs for many of the species caught by CNMI-based fishermen were determined using rules of thumb for data-poor situations and therefore based on catch history. Some of these ACLs may need adjustment, as may the methods by which the catch data are collected and compiled, which is currently on a voluntary basis. The social and cultural ties to fishing remain strong for both the indigenous peoples of the CNMI and immigrants, thus so is the need to fish on a sustainable basis.

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